



# INDUSTRIAL-ARTS MAGAZINE

Incorporating: **HANDICRAFT and the ARTS AND CRAFTS MAGAZINE**

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## EDITORIAL CONTRIBUTIONS.

The editors invite contributions of all kinds bearing upon the Industrial-Arts Education, Manual Training, Art Instruction, Domestic Science, etc. Unless otherwise arranged for, manuscripts, drawings, projects, news articles, etc., should be sent to the Publication Office in Milwaukee, where proper disposition will be made. The Board of Editors meets once or oftener each month in Chicago, and everything submitted is given careful attention. Contributions when accepted are paid for at regular space rates. In all cases manuscripts should be accompanied by full return postage.

The Industrial-Arts Magazine is on sale at Brentano's, New York City, and A. C. McClurg & Co., Chicago.



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# INDUSTRIAL-ARTS MAGAZINE

Vol. V

APRIL, 1916

No. 4

## PRACTICAL FUN IN COVER DESIGNING

Pedro J. Lemos, Director San Francisco Institute of Art



If you wish to have interest in cover designing present the problem to the class with limitations. To give the students all liberties, leaving them to choose size, subject and unlimited colors, results in work crowded with too many ideas, and unrelated to the actual requirements of professional work.

State the number of colors to be used, the exact wording to appear on the cover, and suggest possibly what might be used for decoration of remaining spaces. This makes the problem a real game.

Demonstrate the results that have been obtained with a number of covers previously collected. Explain how many colors have been used to secure certain effects, how a tint of the solid cover is sometimes used additionally, where colors are solid, and how two colors with proper arrangement may be superimposed and produce a third color.

Students will find that splendid results can be secured with but few colors, and they should be impressed with the fact that the cover designer should strive to secure the maximum results, with a minimum amount of colors. Every additional color used, means additional engravings, additional "runs" for presses, which involves preparation, more ink, time and labor, meaning hundreds of dollars in extra expense if the magazine requires a large edition.

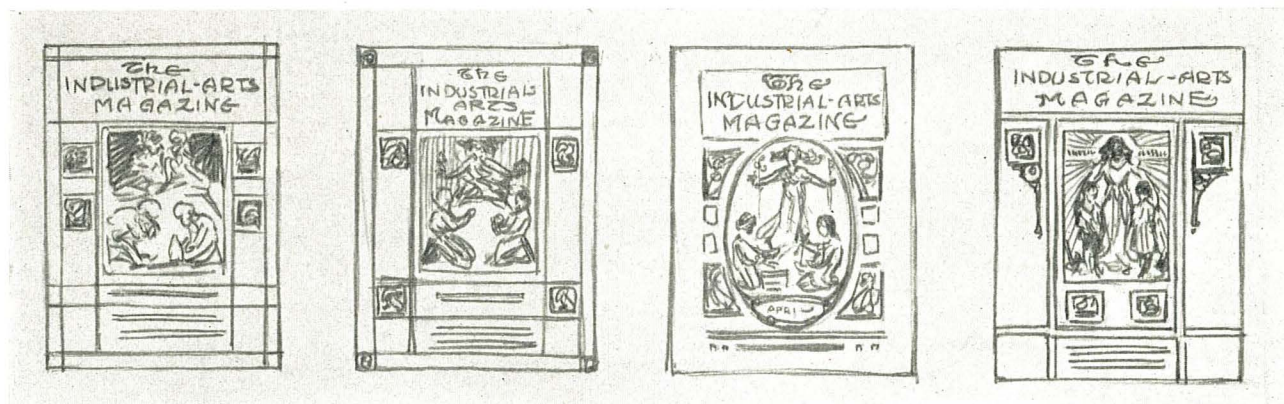
The teacher, too, should realize that there are covers and covers—covers for hand-bound books, covers for leather machine bound books, cloth cover

books, magazines, newspapers, etc. Each kind of cover requires a design adaptable to its own production. There is a world of difference between a design to be hand-stamped on an edition de luxe and a design to be cut in brass dies for machine-stamping a fifty-thousand edition.

Just how shall you know the difference? Easy. Having decided the kind of cover you are to present as a problem, tell your troubles to your nearest publisher, ask him to loan drawings, plates, etc.; and you'll find him willing to assist you in educating the growing generation to appreciate all that goes toward making a book.

And here's a little secret for art teachers. If you wish to make your work practical and lasting in influence, keep in close touch with the industries. The teacher who is going to teach design according to a clever little plan of her own, because it's the course of least resistance, ignoring the technical requirements of the industries, is going to find "breakers ahead." Whenever it is possible, enthuse the students with a trip thru a publishing plant. Let them know how it's done and they'll work the problem with a vim, because they've seen its importance—hundreds of people all working to make a book—to which has been added somebody's cover design to beautify, protect and make attractive the subject within.

After the students have received the specifications for the cover they should prepare a number of



"Thumb nail" sketches are first worked out, enabling the designer to make several arrangements of the material to be used. The best one is then used for the finished drawing.

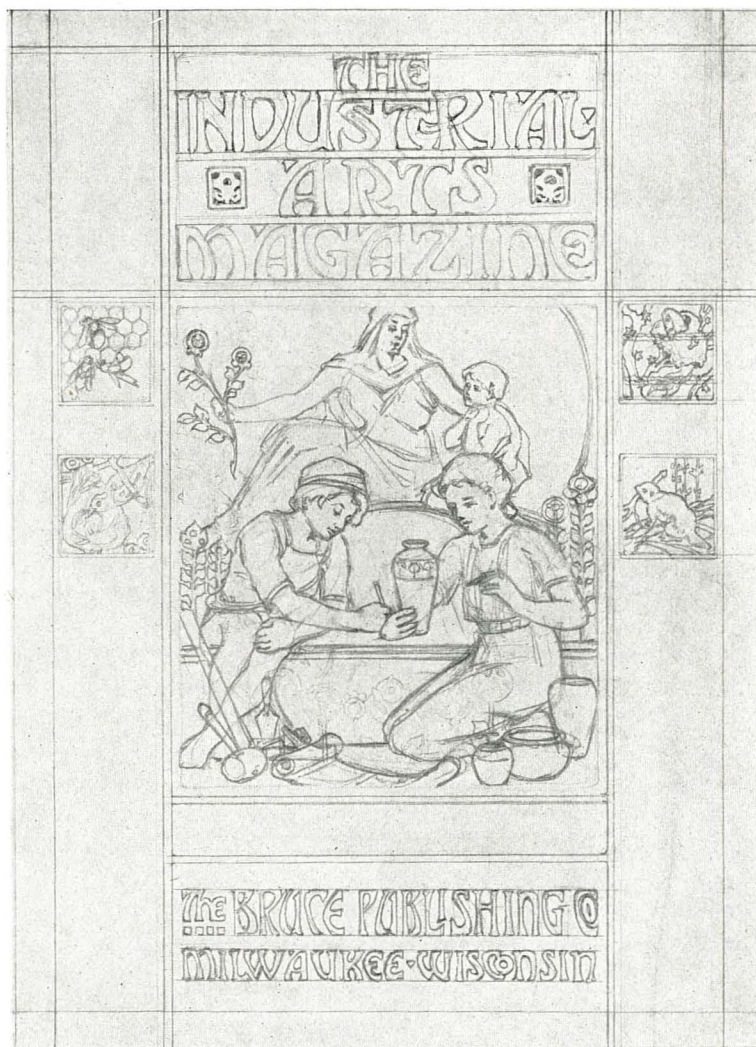


rough sketches, but wait, for before the sketches there should be a lot of thinking. Square acres of covers are turned out every month, just repetitions in ideas, nothing refreshing in arrangement. So encourage the students to new ideas, not queer or eccentric, not puzzles or odd arrangements, but a new viewpoint of the subject to be worked out in pleasing effects.

Have students make notes of the number of lines of lettering to be "displayed." When they decide on the number of subjects or "motifs" to be used,

Receiving the specifications clearly defined, I immediately commenced to think of some idea for the design that would also allow for the necessary lettering.

Here was a magazine published in the interests of those furthering industrial art. Industrial art, the combination of art and the industries, the bringing of art to earth, the refining of industrial productions. It was Sir Walter Crane who said that it should not be possible to know where art ends and the industries commence. I believe Sir Walter Crane



The details of the cover were first carefully outlined on paper, and then transferred to the final working surface.

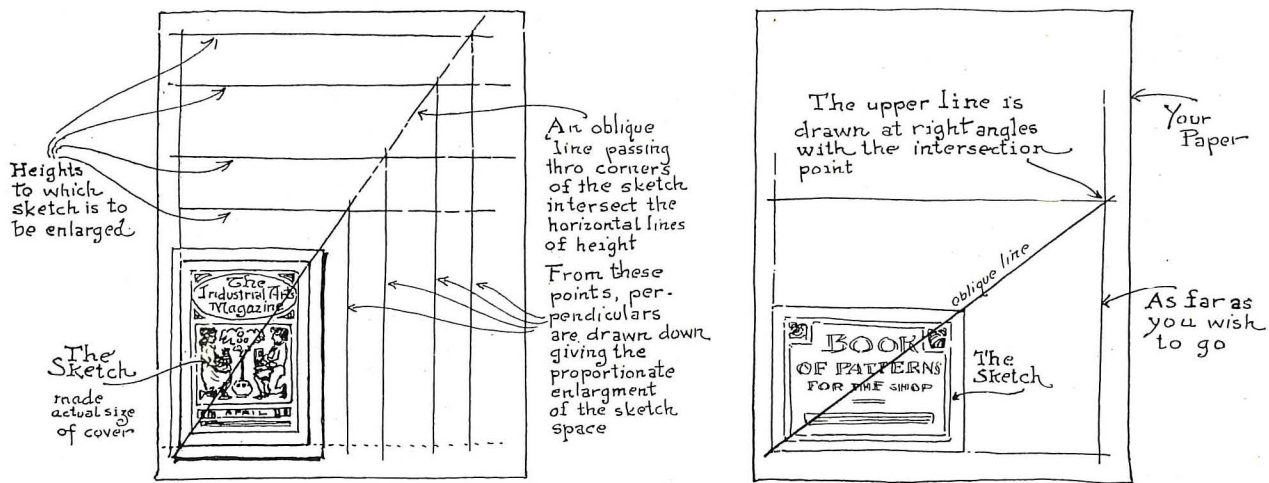
have them plan their rough sketches so as to accommodate such material.

By the way, the best way, the very best way, for a teacher to teach cover designing is to actually do some, and the more mistakes you stumble on to, the better prepared you will be to help the students overcome theirs. The best way for me to explain the progressive steps of making a cover design is to tell how I made one for the *Industrial-Arts Magazine* competition, and here it is.

would even object to the hyphen between the two words on the cover of the *Industrial-Arts Magazine*. Ruskin also stated that, "wherever the industries were best developed, there art flourished." Surely they belong together.

The wave of industrial arts in our schools has been the greatest movement in education that has entered educational development and its reason is naively expressed in the Chinese proverb which reads—





A rough sketch is generally made in the actual size of the cover. As better results are obtained in the engraving from an enlarged drawing, the sketch proportions can be increased for the final drawing as shown in this diagram.

Teach your son a trade before he's twenty,  
Whatsoe'r his power.  
Plant rice, and wheat and beans aplenty  
Not too many flowers.

Therefore I decided that my design should represent the combination of art and an industry, and I concluded to use symbolical youthful figures representing draughtsmanship and pottery.

Back of drawing and application, however, must be something else,—observation. So I planned a child being shown the principles of design so evident in Nature. Thus my trinity—First, Study of Nature; Second, Design; Third, Application. Reverting to Nature, it occurred to me how nature has planned in all its kingdoms, instincts which produce wonderful bits of architecture, craftsmanship and patterns, and I decided to represent this, with four decorations as follows: A bee making honey-cells to represent the insect world. A Weaver Bird to represent the bird kingdom. A fish with its nest and a coral growth for the third decoration, and a beaver for the animal kingdom.

Having decided on my illustration subject, and knowing my lettering matter, I made out the following list with notations as follows:

- 2 printing plates—one in tint, one in solid ink.
- 1 large symbolic panel (3 principles).
- 4 small decorative panels (insect, bird, fish and animal workers).

#### Lettering Display.

The Industrial-Arts Magazine—largest.  
The Bruce Publishing Co.—medium  
Milwaukee, Wisconsin—smallest.

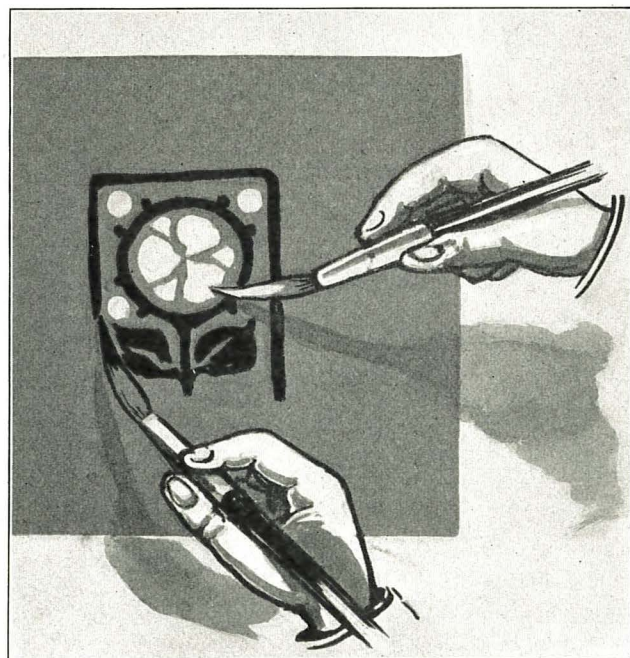
#### Panels.

- First—Title.
  - Second—Pictures.
  - Third—Publisher and Address.
  - Fourth—Blank for Month and Year.
- Everything plain before me, each to be considered.

Now it occurred to me that with five pictorial subjects on the cover, unless some were subordinated they would all fight for prominence. To sacrifice the details of some was necessary and I decided to leave off any white in the four decorative panels for this reason, leaving the center of interest in the symbolic figures. To further the trinity of the figures I sketched several compositions, finally arranging the three principles in a triangular plan.

Feeling that lettering could be decorative as well as legible, and that too often lettering appeared to be an addition to a design, a part separate and unrelated, I planned a letter that would become a part of the whole and a necessary part to the scheme of balance.

Now for actual work. After having discarded several "thumb-nail" sketches and having decided on one, the next step was to increase it to the de-



By using a "middle tone" paper and adding the black and white to it, a "short cut" to the three tones was solved.



sired size. This was done as shown in the accompanying illustration, and was made in outline on a thin piece of paper. Making it on thin paper allowed for erasures and reconstruction of parts without destroying the surface of the paper to be finally used.

The requirements stated a solid color, a tint and a white. Why that's a problem in three-tone drawing! Instead of starting in with white paper, it was better to start in with a paper having the tint or middle tone, and work from the "middle toward both ends." So I secured a toned paper of pleasing tint and decided to make the design in black on this tint, adding the white with a water color or illustrator's white pigment generally known as Process White, Dick's White, Semple's White and other trade names.

Having completed the enlarged drawings I rubbed a soft pencil on the back of the sheet to enable me to trace it onto the tinted board, instead of using carbon paper. Carbon paper produces a greasy line, tending to repel water color when applied.

After it was traced I next placed the black, using a medium brush and drawing ink. After this dried I added the white paint with a brush, taking care that this was balanced in location, as I realized that a scattered distribution of this lightest value would be disturbing to the unity of the cover.

That was all there was to it, excepting carefully erasing the pencil lines remaining visible, covering the drawing with a paper flap to protect the surface, and sending it to the publishers in time to reach them before January 3rd, at 12 o'clock noon.

## Announcement

**M**R. EDWARD F. WORST, Supervisor of Elementary Manual Training and Construction Work, Chicago Public Schools, will begin a series of articles in the June number of the Industrial-Arts Magazine. The subject of the articles is **Elementary Construction**. The work given will be the same as that pursued by the regular teachers in the first five grades of the Chicago schools, under Mr. Worst's supervision.

This work has been tried out and proved to be educative, systematic and practical, and inexpensive. On the whole, it is directly related to the various phases of academic work carried on in both graded and ungraded schools.

Mr. Worst is recognized as the leading authority on elementary construction work.

The articles will appear at least one month in advance of the months for which the work is planned. The June number will contain the work for September.



# THAT COVER COMPETITION



THE competition for covers of the *Industrial-Arts Magazine* has been a remarkable success in unexpected ways. When the Editors of the *Industrial-Arts Magazine* offered this competition they took up the challenge of some critical laymen who contend that American teachers of design are unable to produce a marketable product in the line of their own teaching. This was a serious charge. The editors did not believe it was a just charge in a majority of cases, and we believe the results of this competition vindicate the teachers.

In all, twenty designs were sent to the Publishers. This means that within a short eight weeks of the busiest school season, a score of teachers spent many hours each in the careful preparation of these covers, and produced with very few exceptions designs that are usable, and several that we believe are original and attractive.

The second surprise for the Editors lies in the fact that the weakness of the covers of second choice lies in the composition rather than in the execution. To be candid, we had expected some very bad lettering and drawing exposed by this competition. We are happily surprised that the designs are well executed, and beg the teachers' pardons for our suspicion that they could not letter and draw well.

Our third happy surprise was sent by Pedro J. Lemos, of the San Francisco Institute of Art. Mr. Lemos not only sent the design used on this Magazine, but sent with it the article "Practical Fun in Cover Designing" which we publish in this issue. The cover and article *speaks for themselves*. Mr. Lemos has said for us some things we have in mind as essential with regard to cover design. Yes! with regard to Industrial design in general.

His article is a clear example, as well as a clear statement, of the great necessity of *methodical and thoro study of the project in design*. His article is, furthermore, a splendid example of the use and necessity of freehand sketching in the formulation of a design. Such ability is, we believe, an asset that teachers of the Industrial-Arts cannot afford to neglect.

To give our readers the full advantage of this competition we reprint eight of the designs in miniature, and submit some of the comments of the judges.

The decision of the judges could only be *settled by majority*, and we predict that the same variety of opinion will exist among our readers. The opportunity to emphasize points of design is evidently worth while even tho opinions are at variance. Indeed, we suspicion, in the light of this competition, that artists *even more than doctors* disagree.

The final decision (by a close margin) was in favor of No. 1 as the best design submitted. So simple, so well drawn and with spaces well adjusted, it

excelled over the more pretentious and laborious designs. So it is with Art! Industry and Art are supplementary, and Industry without Art works overtime and makes much ado. Art regulates Industry and makes it purposeful and effective. Art and Industry are a team that "wins in a walk;" not by the "sweat of the brow," and there is no blare of trumpets or crash of cymbals at the finish.

Number 2 is on the whole an effective design. It appears a little crowded with interests, but is saved by careful adjustment. There is a near equal division between the lettering and the panel that might have been avoided. The drawing of the figures is faulty, and the second line of lettering is crowded.

Number 3 is unique. It has been reproduced in line because no finished tone drawing was submitted. The small sketch which suggested the adjustment of tones did not show improvement in effect over this line drawing.

Number 4 needs a margin to hold the dominant panel in proper relation to the cover. The execution of this design is mechanically excellent, but we associate that figure with a pendentive mural decoration, and cannot help but feel that it is transposed.

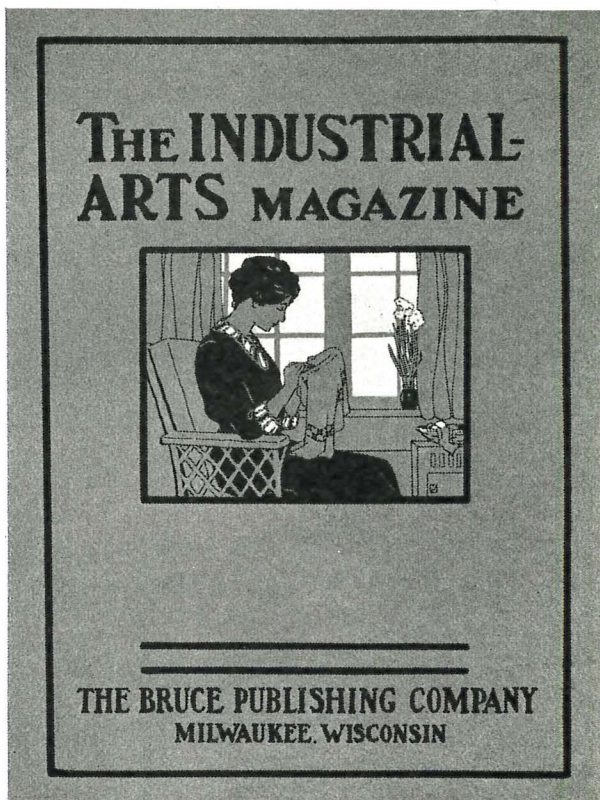
On the second page of reproductions are shown four of the more strenuous and elaborate designs. Our mechanical editor was especially interested in Number 5: "Look!" said he, "every interest that industry ever indulged in is represented." And so they were! Represented in well drawn little squares that make up a border for the cover with a modern Vulcan at the center pounding out progress that radiates to each of the busy workers of the border. This cover is a pictorial anvil chorus. The many interests of the cover are so pronounced over the title that we are reminded of a city store where the goods are all in the window. There is enough well drawn significance in this design to make twenty-seven designs, not counting the corners. We hope that this designer will utilize some of this material in simple and effective covers which we will be glad to receive and use on future numbers of the Magazine.

Figure 6 impressed the judges as out of scale, and perspective. It is out of scale because the exaggerated machine and the struggling workers who operate it are so reduced that they appear insignificant in the composition. It is out of perspective, because the pedestal is projected forward and made important over the group it supports. The circle helps some, but fails to overcome these difficulties.

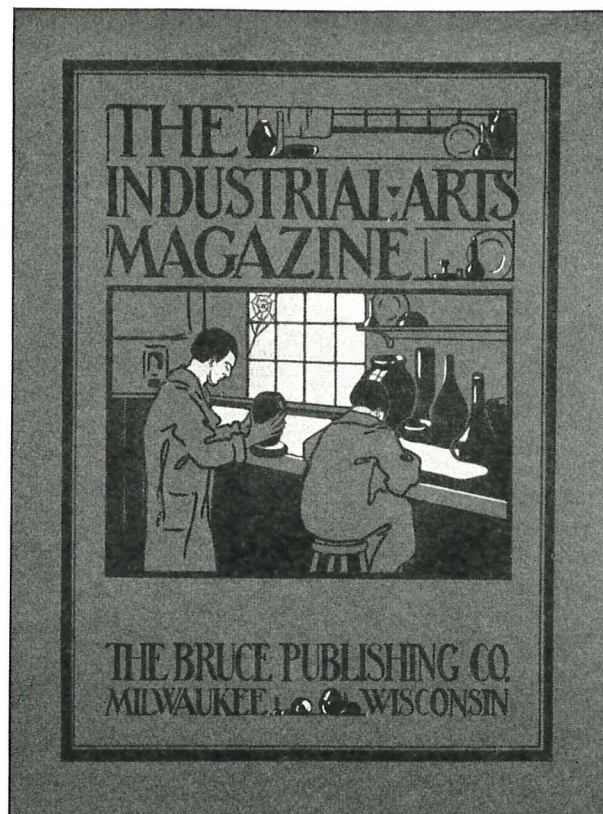
Figure 7 is elaborate and topheavy. The panels are interesting and well executed, but the title, the border and the panel seem to contend for attention. The charm of simplicity is lost by three such pronounced interests.

Number 8 is a passable and usable cover. We





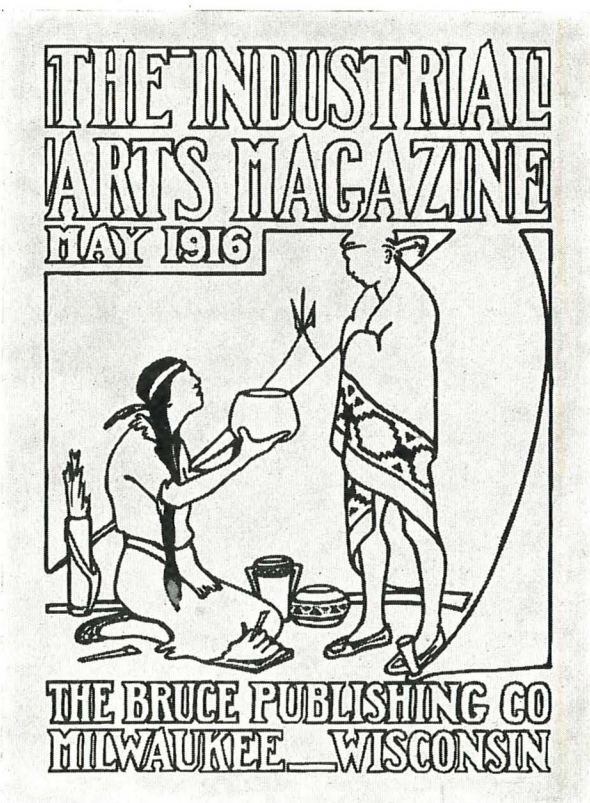
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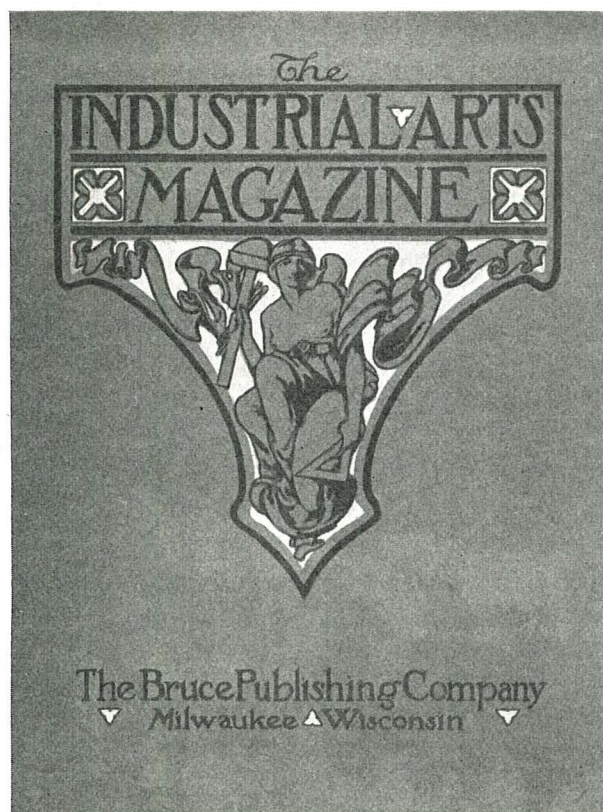
No. 2.

believe a little reduction in the width of the panel would improve this design. Mark Twain said "Doubtful eggs are bad eggs." He said this before the practice of cold storage. We

may now classify eggs as excellent, commonplace and bad. Design Number 8 is not excellent or bad. Is it commonplace? We recall a famous teacher of design who asserts that *artistic*

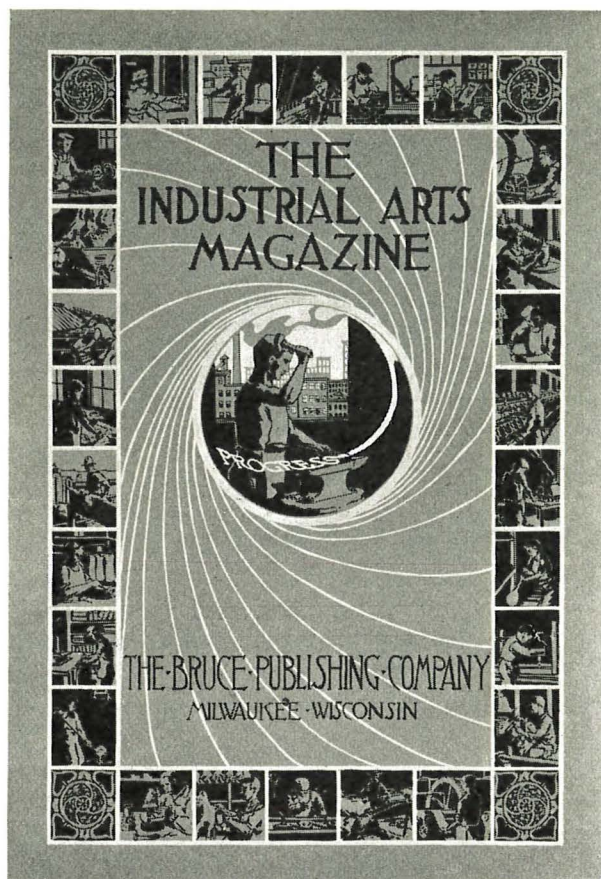


No. 3.



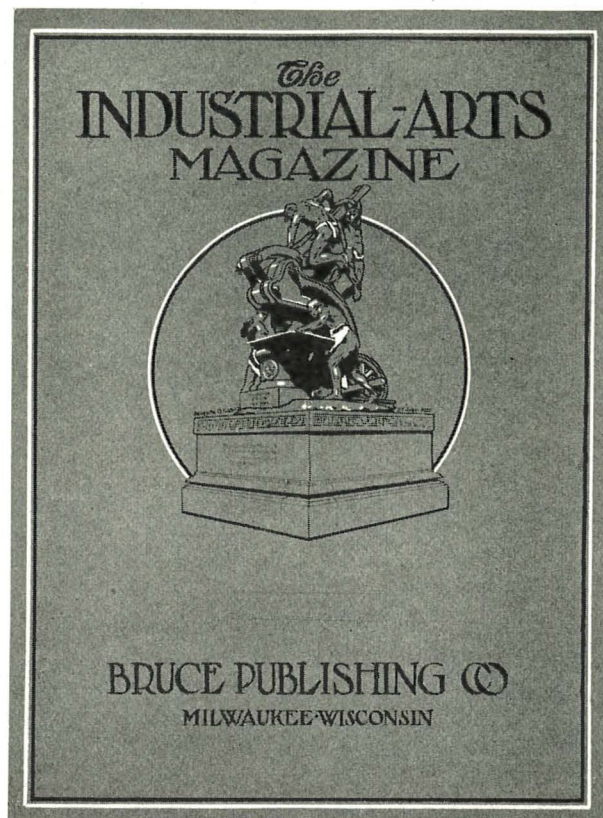
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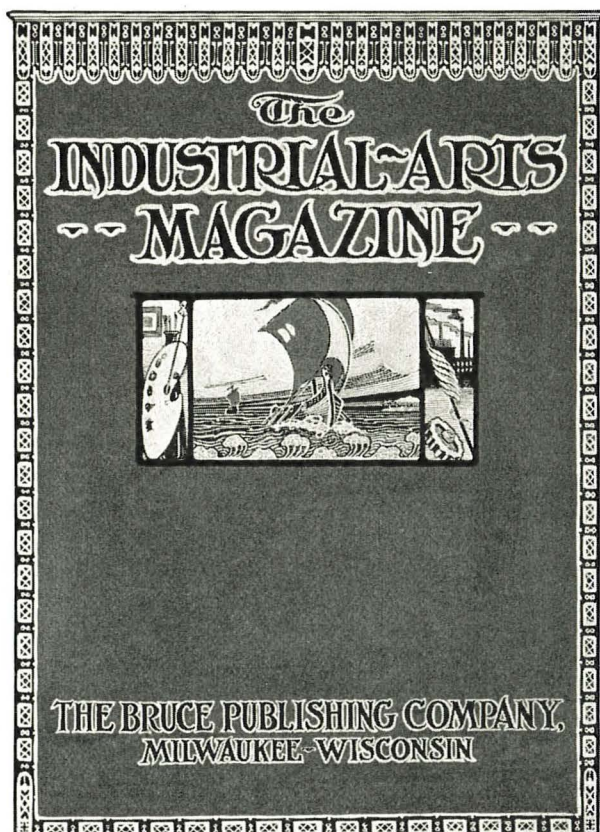
No. 5.

production is never commonplace. Of course, we hope for artistic and exceptional cover designs on the *Industrial-Arts Magazine*,

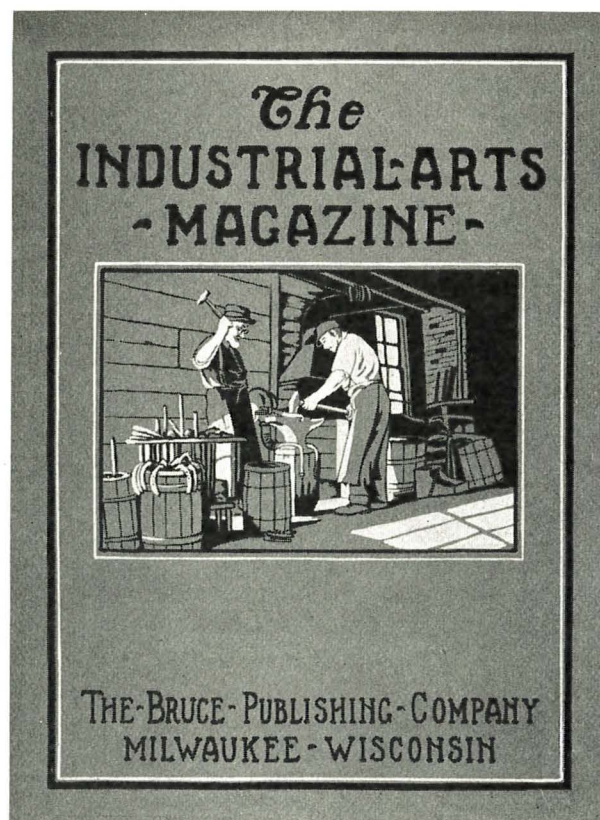


No. 6.

but we have received designs from professional designers that average no better than these submitted by our readers, and the average excellence of them is highly gratifying to the Editors.



No. 7.



No. 8.



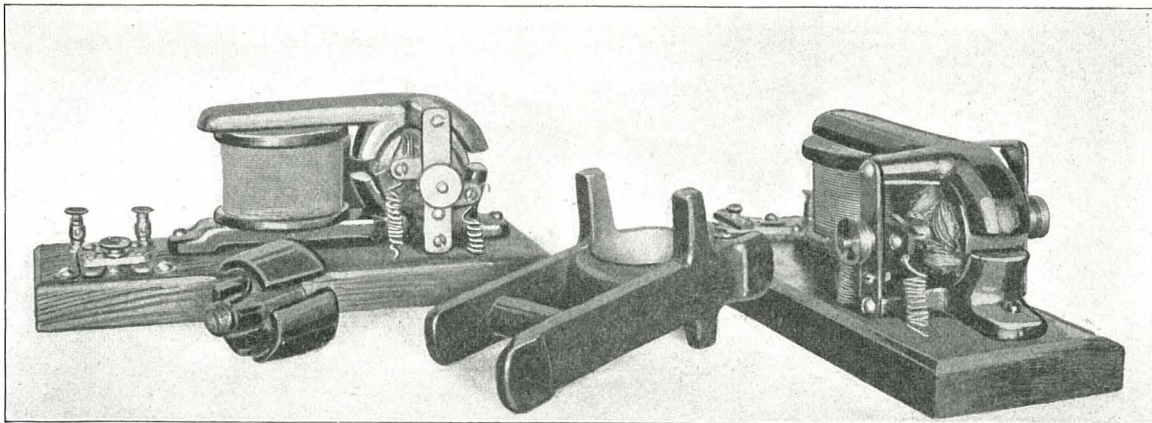


Fig. 1. Two completed Motors and a Magnet Casting and an Armature Casting.

## An Electric Motor for the Eighth Grade Classes

Lorfu E. Hainert, Teacher Training School, Jersey City, N. J.

### Working Drawings.

**T**HE Jersey City course of study aims to give industrial knowledge, and vocational guidance thru contact with a number of fundamental industries. The second half year is given to metal working trades, especially to foundry and machinework.\*

The electric motor has proved one of the best projects for the third term's work. This motor, or a similar type, has been a regular project in the first half of the eighth-grade year, for the last three years. It has been given to twelve entire classes of 14 to 29 pupils.

The points of special value to the boy may be grouped as follows:

1. Metal working: Some experience in handling several different metals, and a better knowledge of their special uses.
2. A taste of the machinework, contact with an engine lathe, drill press, vise work, etc., which clarifies, in some degree at least, his ideas of the machinework, its tools, and processes.
3. Electrical knowledge: He is forced to make frequent use of such terms as conductors, insulation, electro magnetism, resistance, short circuit, etc., and to think clearly about them.

The project is entirely practicable for a regular woodworking shop. With finished castings it can, and has been done, in some of our shops, with no special equipment other than a bench drill, screw-plate, taps, a few files, and hacksaws.

If there is a machinework in the High, or Vocational School, this work makes a good problem in

commercial production, and is simple enough to be placed early in the course. A motor that will run after a fashion may even be made without machining the castings at all—merely smoothing them up a little with the file (in which case the diameter of bore in field magnet pattern should be a scant 1 15-16 in. instead of 1 3-4 in. as in the drawing). My own shop, however, is blessed with one little foot-power metal-working lathe, and we are fully convinced that the "lathe experience" which the boy gets in machining his castings is one of the most valuable features of the problem.

To give each boy his opportunity at the special tools without waste of time, requires very careful organization. The question has been asked repeatedly, "How can you keep the entire class busy when you have special tools for only a few?" The special tools must be kept in use all the time; but there are many of the operations and parts to be made which require no special tools, and these parts such as base, disks, fibre, brush holder, etc., are adapted to the woodworking equipment. The lathe, especially; must be in use every minute of the time. To do this a demonstration of the lathe work is given and two boys are selected, one to be the "Master," the other the "Apprentice." As the master finishes his work his apprentice becomes the master, and a new apprentice is assigned. This same method of progress is used in other operations. In the meantime while a boy is waiting his turn, he is busy on his other parts mentioned above, for this work has also been covered in class discussion.

The shortage of special tools means that the demonstration and class discussion of a step may be weeks removed from its performance by some pupils. During the past term we have tried the experiment of posting "Instruction Cards," which are given below. They seem thus far to increase careful and indepen-

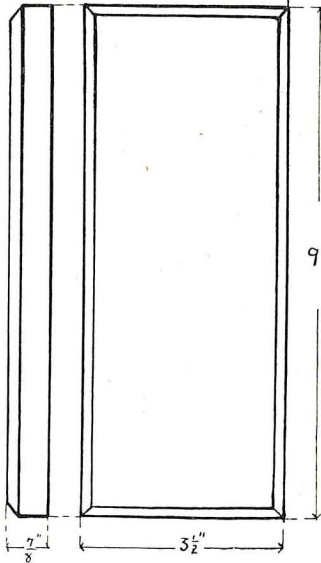
\*See The Industrial Arts in Seventh and Eighth Grades, E. B. Kent, Manual Training Magazine, April, 1913.

The following additional equipment has been gradually accumulated in my own shop, and is of course a convenience, tho none of it is really essential. 1 foot lathe; 1 bench drill; 2 hand drills; 5 machinist's vises; 4 snips; 6 hacksaws; 12 machinist's hammers; 1 gas stove, single burner; 2 soldering irons; 12 flat files, 10-inch; 6 round files, 10-inch; 1 jeweler's saw; 2 pliers, 6-inch; 10 center punches; 1 tap,  $\frac{3}{32}$ , and wrench; 2 twist drills,  $\frac{3}{16}$ ,  $\frac{5}{32}$ ,  $\frac{1}{8}$ ,  $\frac{3}{32}$ .



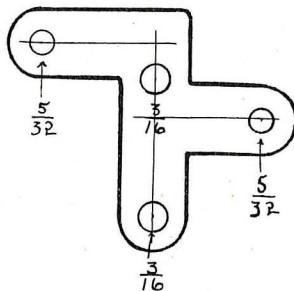
dent thinking by the boys, rather than to take the place of thought. The directions refer to the more mechanical details, and lead him to depend more on the drawing and less on the teacher. They do not, of course, take the place of any class discussion on the *why* or the *how* of the work.

INSTRUCTION CARD NO. 1.  
BASE.



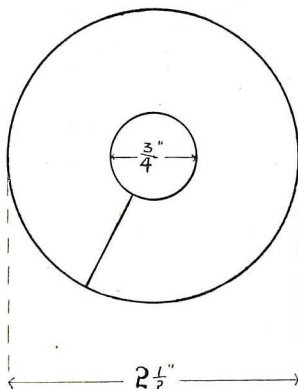
FIBER BRUSH HOLDER.

1. ? Report—Show.
2. ? Report—Show.
3. ? Report—Show.
4. Second end, or length.
5. Second edge or width.
6. Chamfer.
7. Sandpaper.
8. Stain (and dry).
9. Wax.



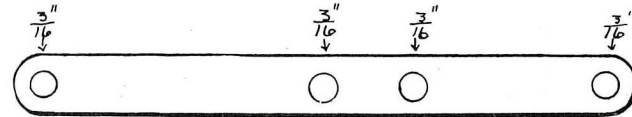
1. Mark out, using template.
2. Saw out.
3. File.
4. Center punch, using dividers.
5. Drill—Note sizes.

CARDBOARD DISKS.



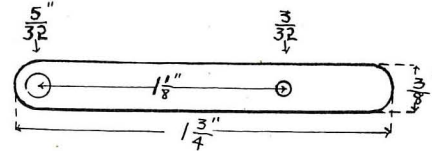
1. Scribe circles on cardboard.
2. Bore out centers, using  $\frac{3}{4}$ " bit and a piece of soft wood.
3. Cut out. Show first one complete.
4. Make six good ones.

INSTRUCTION CARD NO. 2.  
BEARINGS.



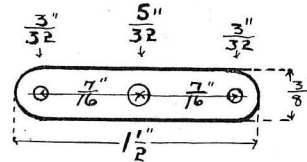
1. Cut 2 pieces of  $\frac{3}{8}$ " x  $\frac{1}{8}$ " stock to fit magnet.
2. Center punch for end holes to fit holes in magnet—Show.
3. Drill end holes—Note size.
4. Drill center hole using jig.

SWITCH—BRASS.



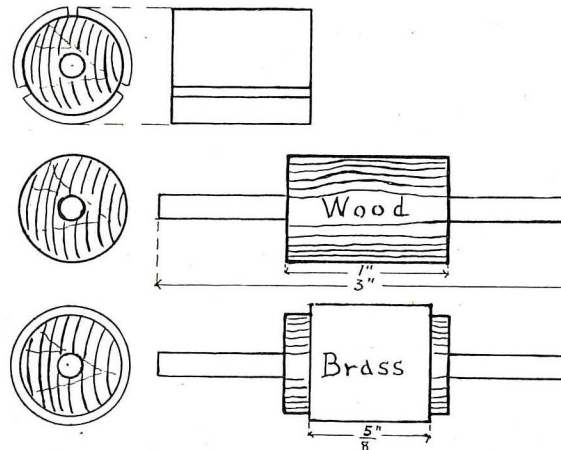
1. Cut 2 pieces of  $\frac{1}{16}$ " stock.
2. Locate holes with four lines and center punch—Show.
3. Drill holes—Note sizes.

FIBER.



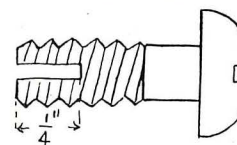
4. Make one piece of fiber.
5. Center for holes—Show.
6. Drill holes—Note drill.
7. Sandpaper all parts.
8. Rivet parts.

INSTRUCTION CARD NO. 3.  
COMMUTATOR.



1. Cut a 1" piece of dowel.
2. Drill dowel, using  $\frac{3}{16}$ " drill on lathe.
3. Glue piece of dowel on brass rod, thus.
4. Turn down wood to fit  $\frac{5}{8}$ " piece of  $\frac{1}{2}$ " brass tubing.
5. Glue on brass tubing.
6. Remove the shaft, and trim wood.
7. Saw brass tubing into 3 equal segments.

BRUSH POSTS.



1. Hold machine screw between two pieces of soft wood in vise jaws. Why?
2. Saw  $\frac{1}{4}$ " slot in two  $\frac{5}{8}$ " machine screws, using a jeweler's saw.

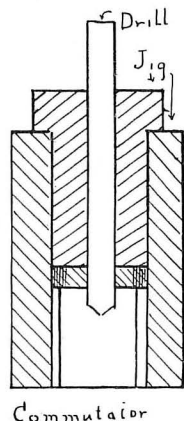


To make the commutator without the use of a lathe:

1. Cut a straight strip of newspaper  $\frac{7}{8}$ " x 20".
2. Apply thin glue or thick shellac to six inches of this.
3. Begin winding this end upon the shaft as tightly as possible.
4. Apply glue to the next section and continue till paper makes snug fit in brass tube.

Another way:

1. Fit and glue a piece of wood into brass tubing.
2. By use of jig, drill hole in commutator for shaft.



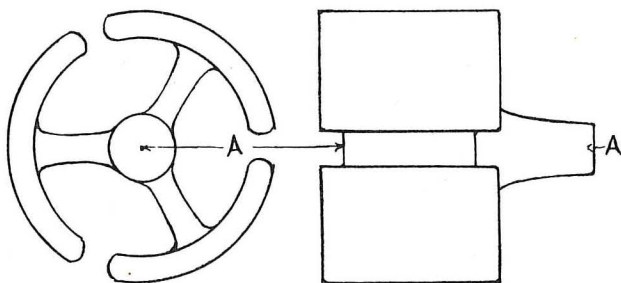
#### INSTRUCTION CARD NO. 4.

##### ARMATURE.

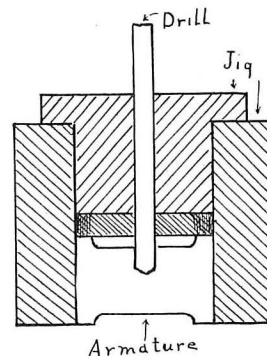
1. Center casting with dividers and center punch at A A.
2. Drill casting for lathe centers with 5-32" drill going  $\frac{3}{8}$ " deep.
3. Countersink drill holes for lathe centers.
4. Turn up side and end of casting for lathe centers.
5. Drill thru casting for shaft in lathe, using  $\frac{3}{16}$ " drill.
6. Recountersink shaft holes.
7. Take off final shaving to  $1\frac{13}{16}$ " diameter.
8. Turn up other end of casting in lathe chuck.
9. Cut off nipple and turn end.
10. File out inside of casting.
11. File all inside edges slightly round.
12. Solder in shaft.
13. Insulate armature.
14. Wire armature.
15. Put on commutator.

Preparation of wire for armature:

1. Cut three pieces of wire 24 ft. long, No. 22.
2. Make small loop in ends of wire to hold insulation.
3. Wind wire on three pieces of wood, remove edges of wood.



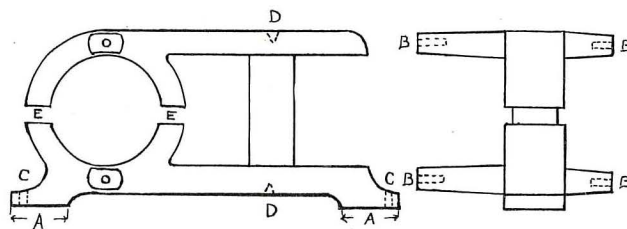
1. The armature can be drilled without a lathe by the use of a jig.
2. To solder in the shaft:
  1. Heat the armature.
  2. Insert the shaft.
  3. Apply solder (the heat of the armature is sufficient to heat the shaft enough to melt strip solder).
  4. Move the shaft in and out to spread the solder.
  5. Turn the shaft until solder sets to get it true.
3. To insulate the armature:
  1. Give it several coats of shellac—or
  2. Cover all inside surfaces with insulating tape. (The longest way; but most satisfactory.)



#### INSTRUCTION CARD NO. 5.

##### FIELD MAGNET.

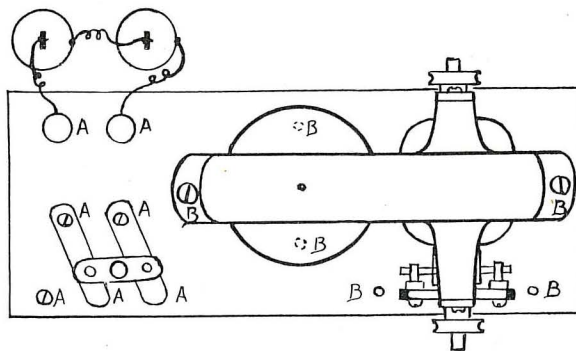
1. File feet A. How? Why? Report.
2. Bore out magnet on lathe to  $1\frac{1}{8}$ " diam.
3. Center for bearing holes B B. Show.
4. Center for screw holes C C. Show.
5. Center for winding centers D D. Show.
6. Drill bearing holes B, using  $\frac{1}{8}$ " drill going  $\frac{3}{4}$ " deep.
7. Drill screw holes C, using  $\frac{3}{16}$ " drill going thru.
8. Drill winding centers D, using 5-32" drill going  $\frac{3}{8}$ " deep.
9. Countersink holes for winding centers D.



10. Tap bearing holes B, using 6-32" tap.
11. Mark magnet for sawing opening  $\frac{1}{4}$ " E E. Show.
12. Saw magnet. Show first saw marks.
13. File all edges round.
14. Glue on cardboard discs to make spool. Show.
15. Insulate core of spool, using cloth and shellac.
16. Paint spool.
17. Wind magnet, using No. 18 wire. Show first layer.
18. Put loops on end of wire to hold insulation.
19. Wind on ten layers of wire or 250 ampere turns.

#### INSTRUCTION CARD NO. 6.

##### CONNECTIONS.



1. Mark out for holes. Show.
2. Drill A, using 5-32" drill.
3. Drill half way thru from bottom, using  $\frac{1}{2}$ " bit.
4. Drill B, using 3-32" drill.
5. Mark for connections. Show.
6. Cut channels.
7. Assemble.
8. Connect.

A 30-hour turn gives ample margin for the work. The time involved in producing the different parts as gauged by the average boy is:



Parts	Time in Minutes
Base.....	85
Brush Holder.....	30
Discs.....	40
Bearings.....	60
Switch.....	120
Commutator.....	70
Brush Posts.....	20
Armature.....	300
Field Magnet.....	500
Assembling of Parts.....	240

1465 minutes  
or 24½ hours.

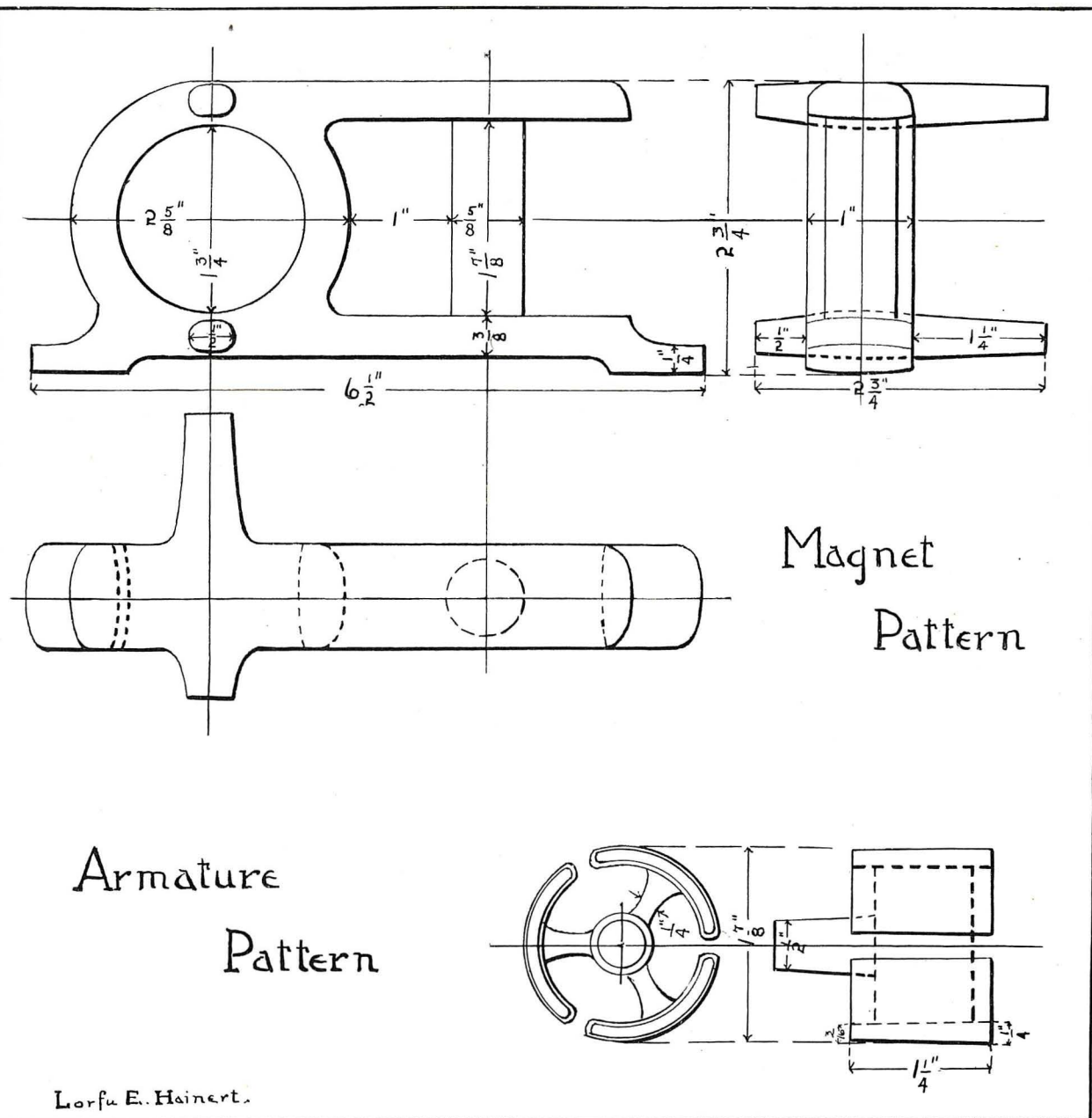
is only \$0.50, which would be a moderate allowance for lumber, if the class were kept upon woodwork.

#### Cost of Materials.

Wire.....	\$0.16
Field Magnet Casting.....	.10
Armature Casting.....	.08
Brass Strip.....	.06
Brass Machine Screws and Nuts.....	.03
Wood.....	.02
Insulation.....	.02
Fiber.....	.02
Brass Tubing.....	.01
Screws.....	.0½
Washers.....	.0½

\$0.50

The fact will bear emphasis, that the work is not expensive. The "Cost of Materials," as shown below,





As a matter of fact its present cost to the board of education is exactly nothing at all, for we have lately begun to charge \$0.50 for each motor *taken home*, and also for any carelessly wasted material. We hoped a few motors might be left at the school; but have been disappointed thus far, as the boys properly regard the finished motor as worth from \$2.00 \$3.00 apiece.

The method of permitting boys to pay for ma-

terials and finished products is a very satisfactory one. It keeps the percentage of waste low, and holds the pupil's interest, thus causing a high percentage of finished work.

The last three classes contained: Class One, 24 pupils; Class Two, 29 pupils; Class Three, 22 pupils. Of these, 22, 23 and 22 pupils, respectively, paid for their motors.

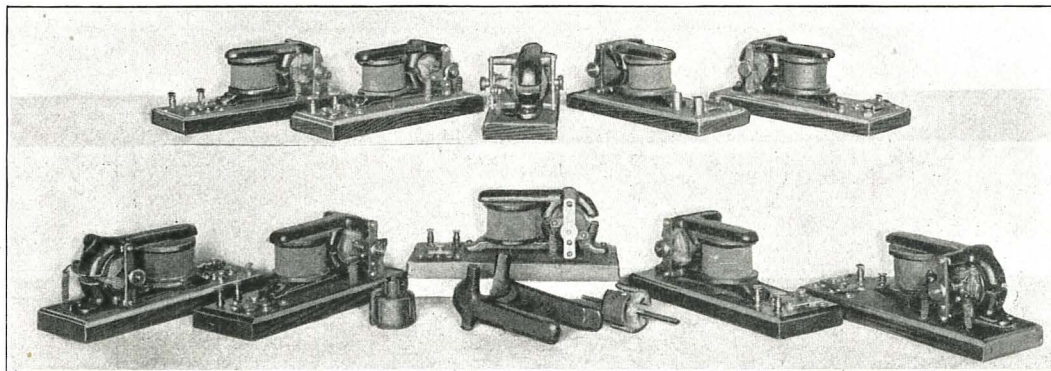


Fig. 2.



# WOOD FINISHING

J. M. Dorrans, University of Wisconsin

(First Article)

## Early Wood Finishing.



It is evident from specimens of early furniture to be found in our museums, that the earliest form of wood finishing practiced was for decoration, rather than for preservation. Crude as this may have been, early wood finishers were much more eager to obtain bright color effects on wood and to hide the poor workmanship that resulted from lack of skill and the use of crude tools, than they were to preserve the wood. Nevertheless, the material used for decoration has, because of its chemical nature, acted as a preservative, so much so, in fact, that some of the specimens in the Kensington Museum, London, are still in a good state of preservation altho they have been buried for hundreds of years.

There is little doubt that the material most commonly used for early decorative wood finishing, and, incidentally, for the preservation of wood, was paint. This early paint was made with white lead and colored with ochers and umbers, or other mineral colors. White lead was one of our first mineral pigments; according to Pliny it was made with lead and acids of wine (vinegar).

It is a rather curious fact that white lead, after being used for thousands of years as the main and perhaps the best pigment for paints, is now being restricted in use and in some countries even discontinued. In France the most drastic measures have been taken against it; here painters are prohibited by law from using it in any form for painting. This drastic step was taken in an attempt to check the ravages of that industrial disease, lead poisoning. *Plumbism*, as lead poisoning is medically called, is caused by the absorption of the white lead into the system thru the skin or respiratory organs. Lead poisoning may be contracted within a few days, or it may take years for it to get into the system. The disease is often contracted from the frequent practice of sandpapering surfaces that have been coated with white lead paint, as the particles of dust that are rubbed off float in the air and are drawn into the lungs. Cleanliness is the best preventative for lead poisoning; keeping the hands clean when eating and wearing clean overalls will help considerably to avoid the disease. Gilding was another early material used for decorating. It was employed in China and India long before the Christian era, as joss houses and idols testify.

During the thirteenth and fourteenth centuries in England and France such woods as oak, chestnut, and poplar were sometimes given no treatment after being made into furniture; they were simply left in the natural. The result of this lack of treatment or

preserving can be seen in the Kensington Museum, where some furniture, or rather what remains of what was once furniture of this period, appears with the surfaces in an advanced stage of decay, whereas furniture of an earlier period that had been oiled only is in a fair state of preservation.

Oiling with linseed oil and waxing, followed painting as a general and commonly practised means of wood finishing. From the fourteenth century on, the finishing of wood was done in various forms, as fashion demanded. Sometimes painting, in the form of enamel work, gilding, oiling, waxing, and varnishing, which came in vogue about the fifteenth century, were means of decorating and preserving wooden furniture. Lacquer work, done by the Chinese, was another form of finish. Inlay in gold and silver, in mother-of-pearl, ivory, and woods which contrasted with the base, was practiced from the earliest times. The inlay of mother-of-pearl and of various woods such as ebony, are still favorite and common forms of furniture decorating now practiced in many oriental countries.

## Need for Finishing.

There are at least two reasons for the finishing or treatment of wood: Preservation and appearance. Being an organic substance, wood is susceptible to change depending upon the moisture content. For instance, if a piece of unfinished work such as a table is placed in a damp room, it will absorb a quantity of moisture almost equal to the atmospheric quantity in the room. The result of this absorption is a swelling and probable warping of all parts of the table, due to the cells absorbing the moisture from the atmosphere and consequently expanding. When the atmosphere becomes dry, the parts of the table will contract or shrink, possibly causing checking and loosening of the joints in the table. It would take but just a little of this kind of action before the table would fall to pieces, or at least become unstable. If the table is made from oak it will swell more readily than if it is made of pine. This is generally true of all hardwoods; they swell more than the conifers when exposed to moisture.

It is obvious that it is most important to stop the action of moisture on the wood cells—swelling and shrinking—by some means if the wood is to retain a permanent shape. The stopping up or treatment of the cells depends on the use to which the particular object treated is to be put. If it is a piece of furniture, oiling, waxing, shellacing, varnishing, etc., are some of the means of finishing. If the object is to be used out-of-doors, paint, creosote or similar material may be used. In this case the treatment is usually given with the thought, not of enriching the



appearance of the wood, but rather of giving it a valuable protection against the varying conditions of the weather, which demand a coating that will be elastic and waterproof.

It will be seen at once that stopping the action of the pores of the wood from swelling and shrinking is a very necessary process, and one that should be done properly if good results are to ensue. It is also important that the action of the cells, which causes expansion and contraction in a piece of work, be stopped on both sides of it. To illustrate: A table top should receive some treatment or finish on both upper and under sides, if it is to remain permanent in form. The finish on the under side of the table top need not be expensive; all that is required is that the cells of the wood be so treated that they will not absorb moisture or change in size with the change in atmospheric conditions. Any cheap, but effective finish, that will fulfill this requirement will be as effective as the expensive finish that is used on the upper side. One or two heavy coats of heavy shellac, — while not cheap — is perhaps as effective as any material for this purpose. Two coats will usually prove sufficient. An interesting example, showing the necessity of finishing both sides of a board was given recently in a large building in Madison, Wisconsin, where it was found that the gumwood used for interior finishing would not stay "put" until the inside of the boards that were next to the wall received a coat of paint. It was found that after this treatment the material would stay in position without warping materially, simply because the cells were stopped.

#### Kinds of Stain and Staining.

Finishes for woods may be roughly divided into two classes, paints and stains. Paint lies on the surface, covering the grain and obscuring the beauty of the wood. Its value consists principally in the fact that it covers the surface and thus preserves it. Paint usually consists of a mineral pigment ground in linseed oil (or substitutes) and in this form it offers an excellent protective coating for wood. Under the heading paint, may be included white enamel. This finish, however, requires more care and skill in its application to obtain satisfactory results.

Of stains and acids used in staining there are various kinds, known as water, spirit (alcohol), oil, acids, alkalis, and varnishes. Stains are made from pigments, aniline dyes, or vegetable dyes. The aniline dyes are now being used more and more extensively on furniture because of their clearness, uniformity of color, ease of preparation, and cheapness. Another consideration in their favor is the fact that they are now being manufactured in a manner that makes them more permanent than formerly.

In addition to painting and staining, there are also methods of treating wood by heating which gives to some hardwoods, such as birch and maple, a rich

brown color that looks very clear when varnished. The material is treated before it is manufactured into furniture by being placed in an oven and heated up to a temperature of about 212 degrees F. This gives the wood a slightly charred appearance until planed, but does not affect its working qualities.

Another method of finishing is by burning. Such woods as cypress, hemlock, and hard pine may be treated this way. The burning is done by means of a torch and is called "Sugi" finish.

Fuming with ammonia (an alkali) and other methods of treating woods with various acids are in use in wood finishing.

Water stains are water solutions of the colors, pigments, or acids used in wood finishing. Water stains are usually regarded as being clearer and capable of penetrating deeper than oil stains. They are very likely, however, to raise the grain of the wood. This tendency requires the operation of sanding over the stain after the application of the stain. Sanding requires a little care, as it is very easy to sand thru the stain onto the raised parts of the wood, thus producing white streaks. To overcome this objection a water stain is sometimes reduced in strength and the work given two coats; or, sometimes the stain is applied, and when dry, is rubbed down with fine sandpaper and a second coat is applied. In the second application the stain is reduced to about one-half its former strength. Sometimes the work is sponged down with luke-warm water before staining; this raises the grain. When the wood is dry, it is sanded down and the staining process is then carried on without the necessity of sanding. The particular process in use depends on the nature of the stain. To get the best results, some stains demand a different treatment from that demanded by other stains. Water stains are best applied warm and with a brush. A warm stain will penetrate further than a cold one but will raise the grain more.

Oil stains may be defined as any pigment or dye that will go into solution or be held in suspension in oil, such as linseed oil, turpentine; or the light hydrocarbon oils, such as gasoline, naphtha, benzine, etc. Oil stains are more easily applied than either water or spirit stains. They have the advantage of not raising the grain, are easily applied and give a more uniform coat. This last quality is something to be desired when the individual who is using the stain has had but little experience in staining.

The claim is made that oil stains will not penetrate quite as deeply as the water stain. This is true where the old mineral pigment is used with the oil; but the day of siennas, umbers, and ochers in wood finishing is almost over. The best and clearest stains are now made from the aniline dyes. Some of these at least can be made practically permanent in color. The value of aniline dye lies in the fact that it can be obtained at practically a uniform strength



and shade, is comparatively cheap, and is much clearer and more penetrating than any of the pigment stains.

When filler is applied over some oil stains (usually those containing a quantity of red, such as mahogany) there is a tendency to rub off part of the stain by the solvent in the filler. This is not always true, however; it depends on the kind of stain. To prevent cutting of the stain a *thin* coat of white, or orange shellac, is sometimes applied over the stain before filling is begun. The shellac acts as a binder to the stain.

Sometimes oil stains require partial wiping or rubbing off. Such requirements, when demanded, are included in the directions issued with a commercial stain. It should be said in passing, it is always well, when using a commercial stain, to follow the directions given for that particular stain, and not to use the method of treatment given for any other stain. It may be taken for granted that the manufacturer is going to give the best methods for applying his particular stain, and in justice to him those methods should be followed. If they are not followed, the blame for poor results should be placed where it belongs; with the finisher. For wiping a stain a piece of waste, enclosed in a piece of cheesecloth, is good. Waste alone is apt to catch on the corners of the work.

Spirit stains: These are similar in method of application to the water stains. They have the advantage of drying faster than the oil and water stains and, therefore, can be worked over a little sooner. The spirit stain usually requires sanding after its application.

Oil or spirit stains are better for old work that has to be renovated than for water stains. The reason for this is that, whereas untreated wood takes the water stain by absorption, the pores of the old wood are practically closed by ageing and from former treatment; the absorption is, therefore, stopped. The water stain merely lies on the surface and does not penetrate.

Water and spirit stains are not so advisable for use on soft woods as oil stain. The spongy nature of the wood is likely to absorb the stain unevenly and, unless the finisher is very careful, a blotchy job will be the result.

In applying stains the method should be to apply with the grain of the wood, using long strokes and keeping the edge of the stain alive. Any lapping lengthwise will not be seen as readily as lapping crosswise will. It is also well to begin with a panel or part under the surface first, and it is sometimes advisable to begin with the work upside down. A good finisher is known by the method he employs in staining a piece of work.

#### Preparation of Wood Before Staining.

Very often because of the lack of time, or the desire to get the finish on, a piece of work that may

have taken many weeks to construct will be rushed thru and slighted in the final sanding and rubbing-down process. No matter how much care is taken in the staining and finishing process it can never hide work that has been slighted in scraping and sanding. On the contrary the staining and finishing process will magnify poor workmanship in scraping and sanding, by bringing out more clearly marks on the surface that have not been revealed in the earlier process. Scraper marks and any scratches from sanding that have been made across the grain will show very clearly. It is also true that the brighter the finish the more clearly marks will stand out. Marks that can hardly be seen during the process of sanding stand out in relief, when the wood is given a simple oil and wax finish. It is a good plan, therefore, after the work has been sanded to inspect it closely for such defects. The hands can be used to feel any unevenness or marks. Very often the hands will detect what the eyes miss. One will be surprised to discover how quickly the touch will be developed in this way.

The first step in the finishing stage is the careful planing of all parts by hand. Very often it is thought that the marks from machine planing can be easily scraped or rubbed out by sanding. This is possible, and is always done if a belt or machine sander is used, but if the sanding is to be done by hand such marks cannot be rubbed out. The mistake of thinking that they can be eradicated by the process of hand-sanding is a common one, and is not realized until after the work has been stained. It is difficult for anyone but an expert to take the marks out of a machine-planed board with a scraper, without first planing it by hand. Besides, it is much quicker and easier to get a perfect surface by the use of the bench plane before using the scraper than by using the scraper alone. Of course there will be a time when the wood is cross-grained and difficult to plane, but when possible, it should be planed first with a sharp plane, the cap of which is set close to the cutter. Such planing will considerably reduce the task of scraping. It should be remembered also that it is not always necessary to use a scraper before sanding. As has been said, a good sharp plane properly set will sometimes give better results on hardwoods than the kind of scraping that is often done. Soft woods should never be scraped.

It is very easy to leave scraper marks on the surface by improper scraping. This will be true in the case of working and scraping quarter sawed oak, as the scraper is more than likely to dig into the softer wood rather than the flake when starting the stroke. A little lead given to the scraper in the operation of scraping is helpful in eliminating these marks.

After the wood has been properly planed and scraped great care should be paid to the sanding if a good finish is desired. It will be found advisable,



and there will be a saving of time, to use a good, medium-coarse grade of garnet sandpaper for such woods as oak, ash or elm, for a first rub down and then to go over the work again with a finer grade of sandpaper. The sandpaper must be sharp to be effective on these woods. For sanding, a piece of cork, rubber, or cork felt glued to a block of wood will make a good pad. Sanding should always be done with the grain of the wood. Fine sandpaper only should be used on close-grained hardwoods.

After sanding and before applying the stain, the work should be inspected closely at the joints for any glue that may be in the corners. It is important that all such glue, or glue found elsewhere, be removed; otherwise the stain will not penetrate to the wood thru the glue, but will run off those parts, which are covered with glue, and leave the places unstained. One has only to attempt to stain over a surface covered with glue to find how impossible it is to get a stain to adhere to it or to make it look like a stained surface that has no glue on it. A sharp chisel, or scraper, will be found to be a good tool to remove glue from the corners. It is usually a better plan when assembling a piece of work, not to wash off with hot water the glue that has oozed from the joint, but to wait until it is rubbery or set, and then to scrape it off. The washing will thin the glue out and cause it to cover more of the surface of the wood and to go into the pores, thus preventing the stain from penetrating.

After the glue has been scraped off, the wood should be sanded again in such places before it is stained. Sometimes when sanding in a corner the sandpaper may be rubbed across the grain of one of the pieces of wood forming the joint. This produces cross-scratches. To avoid cross-sanding, it is a good plan to place a piece of old drawing paper between the sandpaper and the work that would be cross-sanded.

The surfaces of the wood prepared for staining should be free from oil, grease, or glue. It should be well dusted before staining. This latter operation is most important if a good finish is to be obtained. It is one, however, that is very often slighted, and

indeed sometimes neglected altogether; such neglect leads to a cloudy or muddy looking finish that is very often attributed to the stain. The best and clearest stain ever manufactured was never made or intended to be placed on a surface thick with dust. A dirty surface is often the real cause of poor filling, whereas the attributed cause is poor filler.

Time and temper can be saved by giving a little thought to the "little big things" as they may be called. It should always be remembered that a good finish cannot be obtained without the necessary preparation of the surface to be finished and proper care in each operation. Very often a piece of work beautifully designed and constructed will be entirely spoiled thru the lack of a little care in preparing it for the stain. This is primarily due to the intense desire to see how the article will look when the stain has been applied, and to the conviction that such small things as cross-sanding on the surface of the material will not be seen after staining. On the other hand, a piece of work may be wonderfully enriched by giving it a good finish—just the kind of finish that seems to be a part of the structure and which fits into the environment in which the piece of work will be placed.

It is well to have in mind the fact that the place in which the piece of furniture is to be placed will, in most cases, determine the kind of finish to employ. The furniture of the parlor, for example, demands a different kind of finish from that of the kitchen; the kitchen furniture is designed for hard usage and must have a finish in keeping with its use, while that of the parlor, because of its not being subject to the rough treatment of the kitchen furniture, is designed on finer or softer lines and constructed of finer material, and consequently demands a finer finish.

Whenever the design and construction permit the sharp edges of work to be slightly rounded, this should be done. Edges on furniture usually get more wear than the flat surfaces. If they are not rounded they will soon wear white. The rounding should be done with sandpaper held in the hand or placed on a block.

**W**E are not sent into this world to do anything into which we cannot put our hearts. We have certain work to do for our bread that is to be done strenuously; other work to do for our delight and that is to be done heartily; neither is to be done by halves and shifts, but with a will; and what is not worth this effort is not to be done at all.

—John Ruskin.



# Relations Between Drafting Room and Machine Shop

Charles F. Gilman, Jr., Newton Vocational School, Newtonville, Mass.



**D**RAWING is the first step which indicates to the man in the machine shop that which the designer has in his mind. A designer gives his draftsman a sketch of what is wanted. From this sketch the draftsman makes a set of working drawings of the machine, or part, which is to be constructed in the machine shop.

In the Newton Vocational School the aim is to have a system that is similar to those found in outside shops, so that when the students graduate and go to work in the different trades, they will be familiar with the systems under which they will work.

To illustrate the system installed in the Newton Vocational School, let me give you an example: Last year it was necessary to make three more bench milling machines (see illustration), as the machine in the shop was worked to its capacity. This machine was in such demand that when it was sent to the drafting room to be sketched, we were allowed only ten working days. One boy, who was given full charge of the work, was called chief draftsman, and he with three other students, sketched the different parts of the machine.

A drawing list is made out by the chief draftsman, and as the separate parts are sketched, they are checked on the drawing list. In this way, we avoid repetition. In any work the parts must be measured accurately with a steel scale, micrometers, calipers, etc. When the machine is all sketched, the chief draftsman gives out to the members in the class the different parts to be drawn to scale. When the parts are finished, the drawings are given to another student to trace, and in the tracing the drawing is checked for accurate measurement in every detail. By this method one student does not both draw and trace the same part of the machine. When the tracings are finished, three complete sets of blueprints are made. One set is sent to each, the pattern making shop and the machine shop. The other set is made into book form and kept in the drafting room, the tracings being put on file.

Drawings and drawing lists are made on a standard size sheet, the "B" being the unit (8½x11 inches); all other sheets are multiples of this and are lettered in the title space, A, B, C, D, E, etc. Should a small tool of class "X" be drawn on a "B" sheet, the number appearing on the drawing would be "XB." The number following the size letter would be the next higher number (except when some number had been returned) to the A, B, C, D, E or S index. When a drawing number has been taken, tracings of the same size for the identical machine bear the corresponding numbers, with a decimal system after the

number as first drawing 0.1, the second 0.2, and the third 0.3, etc. If another size drawing is used, its number will be taken from its respective index and the decimal system added, as 0.1, 0.2, 0.3, etc., beginning at 0.1 on the new size. Numbering sketches and notes will follow the same system as the regular drawings. The letter S will appear in the sketch or note number in place of the regular size letter on the drawings.

Classification		W	File No.	DRAWING LIST No. 28			
STARK BENCH MILLER				Pages 2 Page 2		Date Jan. 6, 1914	
Compiled by Charles F Gilman Jr Checked by <i>C. H. Brice</i>				Pattern or Piece No.			
	Name of Part		Pc's	Material	Class.	Drawing No.	Part
32	Hand Feed		3	C.I. & Steel	W C	40 .9	A
33	Index Head Spindle		1	Steel	W B	55 .9	
34	Cross Slide Feed Screw		1	Steel	W C	40 .7	B
35	Cross Slide Nut		1	Steel	W B	55 .8	B
36	Long Feed Nut		1	Steel	W B	55 .8	A
37	Spindle Dust Rings		2	Brass	W B	55 .7	B
38	Milling Arbor & Nut		2	Steel	W C	40 .10	
39	Index Head Binding Screws		2	Steel	W B	55 .9	B
40	Sliding Chuck Jaw		1	Steel	W C	40 .11	A
41	Screws on Chuck Jaw		6	Steel	W C	40 .11	B
42	Stationary Chuck Jaw		1	Steel	W C	40 .12	
43	Screws on Chuck Jaw		4	Steel	W A	48 .A	
44	Base & Screws		3	C.I. & Steel	W E	8 .1	
45	Knee		1	Cast Iron	W D	30 .1	A
46	Screws on Knee		9	Steel	W D	30 .1	B
47	Hand Leaver Long Feed Rack		1	Steel	W C	40 .9	B
48	Long Slide, Male		1	Cast Iron	W C	40 .14	
49	Long Slide, Male Screws		8	Steel	W B	55 .10	
50	Head Stock Frame		1	Cast Iron	W D	30 .2	
51	Cross Slide		1	Cast Iron	W C	40 .15	
52	Screws for Cross Slide		4	Steel	W A	48 .B	
53	Long Slide Female		1	Cast Iron	W C	40 .16	
54	Long Slide Female Screws		12	Steel	W B	55 .11	
55	Micrometer Sleeve		2	Steel	W B	55 .15	A
56	T Bolts Binding H.S. to Base		2	Steel	W B	55 .15	B
57	Crank Handle		1	Steel	W B	55 .12	
58	Elevating Screw Bracket		1	Steel	W C	40 .17	
59	Pow Head Sleeve, & Screws		3	Steel	W B	55 .13	
60	Elevating Screw Nuts		2	Steel	W A	48 .7	
61	Head Stock Binder Bolts		2	Steel	W B	55 .15	C
62	Long Feed Screw Bearing		2	Steel	W B	55 .14	
63	Rear & Front Spindle Bushings 1/5 Frame		2	Steel	W B	55 .16	
Notes							

Drawing List.

Illustration of a piece of shop equipment:

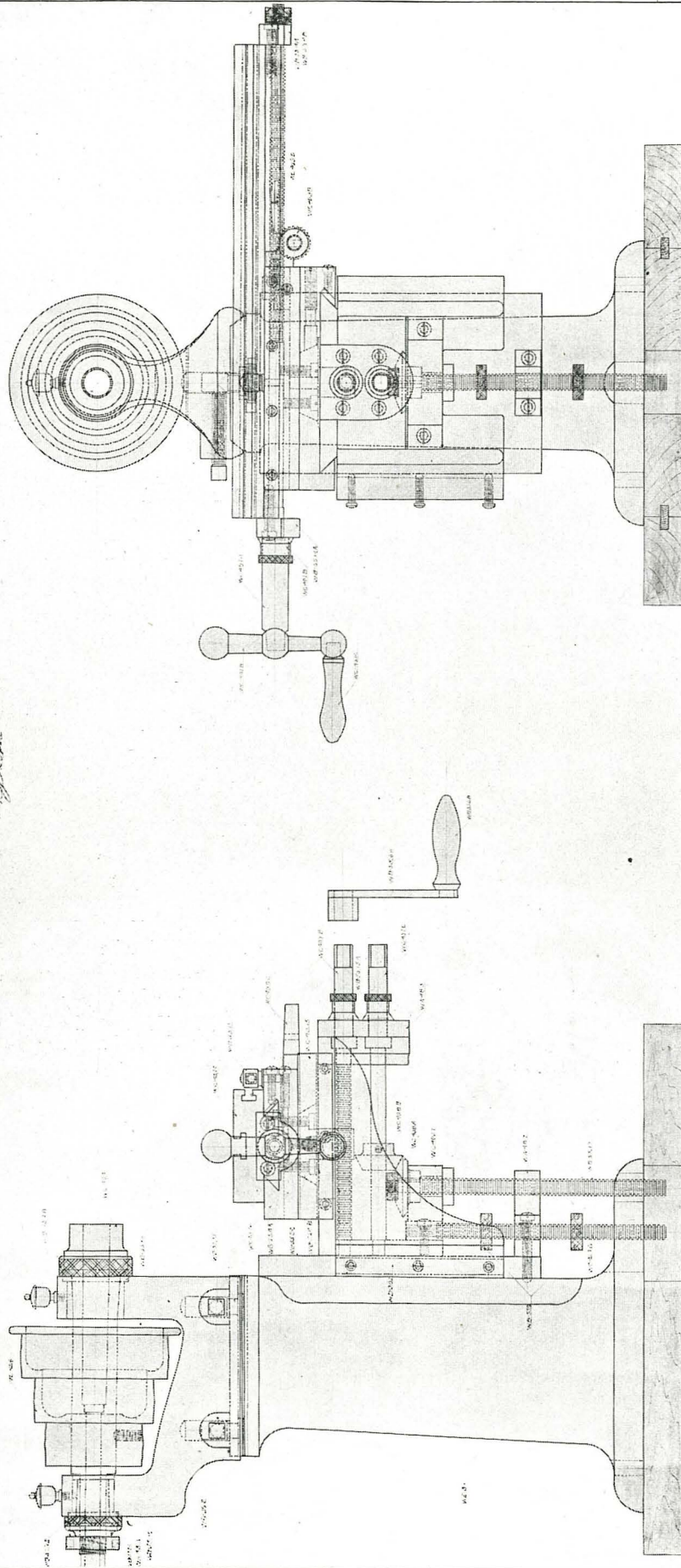
Class	Size	No.	Decimal	Drawing, Piece & Pattern No.
K	A	26	0.1	K-A-26.1
K	A	26	0.2	K-A-26.2
K	A	26	0.3	K-A-26.3
K	A	26	0.4	K-A-26.4
K	D	74	0.1	K-D-74.1
K	D	74	0.2	K-D-74.2
K	D	74	0.3	K-D-74.3

All the different kinds of machines are given different letters of classification: As for example, the milling machine is class "M," and all drawings of this machine will have the same classification and the size, number and decimal will run according to the size of sheet as shown above. The term "Unclassification" means drawings that do not find their



# STARK BENCH MILLER

STARK B.  
*Copyright 1902*



DRAWING FOR A STARK BENCH MILLER.



classification in the regular system. This class is to be restricted as much as possible.

No work is started in any shop without an order, and all of the shop orders originate in the office of the Director. In the drawing room the necessary blueprints, specifications and orders are made for different shops and sent to the heads of departments or shops affected. Any errors or changes on blueprints, or drawings, must be immediately reported to the drawing room so that a new drawing may be issued. When there are any changes to be made in the drawings, red pencils must be used. Special tools or other equipment which are needed in the machinshop or any other shop must follow this same procedure. No student in the shop is allowed to work unless he has a blueprint or another drawing, unless it is on a repair job. At the end of each month, the job cards of the shops go to the office so that the office and drawing room will know how the work in the shops is progressing.

When a shop order with the sketch leaves the office, they are taken to the drafting room, from which a complete set of drawings is made from the sketch received. Tracings and blueprints are then made and the blueprints are sent with the job cards to the shop in which it is to be made. The instructor of the shop puts on the job card the different operations as

they will come to the student who is doing the work. The student when assigned to the job, first weighs the material, finds out the cost and puts it down on the card, with a statement of the kind of material. He also states on the card how much he receives an hour and his name is opposite his operation. If another student works on the next operation, he will put similar data on his card. When a student receives a job, he is given a time-card as well as a job card. He keeps on this card an account of the time spent on the different operations. When the job card is finished, the full time is transferred to the job card and that, with the total cost, is sent back to the office.

It is absolutely necessary for the Patternmaking Shop to be furnished with blueprints of the machine parts which are to be constructed of cast iron or poured metal. From the blueprints, patterns are constructed in wood, and from these castings are made in iron. Each one of the shops is furnished with an assembly drawing sheet; as, the Bench Milling Machine shown, and the number and classification (see illustration) of each part is noted. When a student is not able to see how his part is to function in the machine, he finds the number and classification of his drawing, goes to the assembly drawing, locates the corresponding number and easily discovers his share in the construction of the whole.

## DOMESTIC ART IN THE GRADES

Ada Gause, Pratt Institute, Brooklyn

(Fifth Article)

The Collar and Cuff Set, shown in Figure 8, is the sequential and finishing problem of the other two pieces.

### Material:

Flaxon scraps left from sewing apron.

Embroidery needle, No. 8.

Embroidery floss, mercerized.

Linen tape,  $\frac{1}{4}$  inch wide.

Thread number 100.

Needle number 10.

Cut Collar, back  $10\frac{3}{4}$  inches on warp and  $5\frac{1}{4}$  inches on woof thread.

To Cut Lapels, see Figure 10.

Cut Cuffs, each  $10\frac{3}{4}$  inches on warp thread,  $5\frac{1}{4}$  inches on woof thread.

### Construction Steps:

1. Overcast wrist edges of cuffs and neck edge of collar, back piece only.

2. Lesson on mitered corner, give first in paper.

(a) Cut models for mitered corners, four inches by four inches on thread of material.

(b) Fold on warp  $\frac{3}{4}$  inch, on woof  $\frac{3}{4}$  inch.

(c) Cut corner off diagonally  $\frac{1}{8}$  inch above diagonal crease as shown in diagram, Figure 11.

(d) Fold the bias corner and sew  $\frac{1}{8}$  inch seam with very small combination stitch, begin seam  $\frac{1}{8}$  inch from edge, sew and turn.

Note—Class keep the model to be used when the feather stitch is given.

3. Make mitered corners on the cuffs and baste in hems.

4. Make mitered corners on lapels and baste  $\frac{5}{8}$  inch hems. Note that there is a right and left lapel.

5. Give lesson on feather-stitching.

6. Practice on practice piece.

7. Place feather stitching on mitered corner model.

8. Remove basting on edge of hem.

9. Place feather stitching on all hems, remove basting.

10. Fold  $\frac{1}{4}$  inch hems on lower edge of cuffs, baste and hem with vertical hemming stitch.

12. Press cuffs.

### Finishing Collar:

1. Overlap lapels and center back piece at neck line two inches, and baste together with even bastings.

2. Right sides up, back piece on top.



3. Place collar on table right side up and baste  $\frac{1}{4}$  inch wide linen tape on neck edge.
4. Allow one inch of tape to extend at end.
5. Allow  $\frac{1}{2}$  width of tape to extend beyond edge of collar neck.
6. Baste with even bastings.
7. Sew to collar on edge of tape with hemming stitch.
8. Remove bastings.



Fig. 12a. Boudoir Cap, Supplementary Problem.

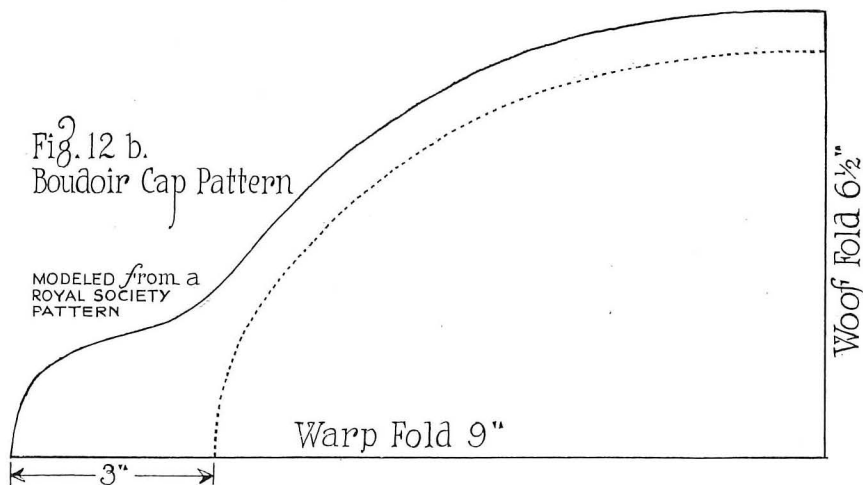


Fig. 12b. Pattern for a Boudoir Cap.



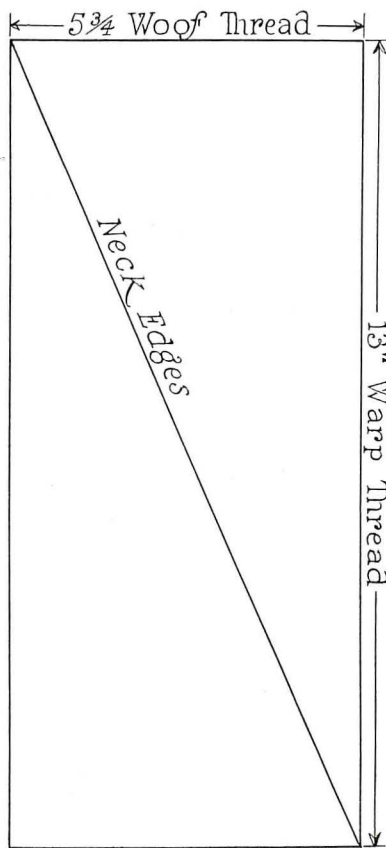


Fig. 10. Diagram of Lapels

9. Turn ends of tape back one inch and over-hand edges of tape together.
10. Turn full width of tape along neck edge to wrong side of collar and baste.
11. Sew tape to collar with hemming stitch.
12. Remove bastings and press.
13. Tag neatly with name and leave with teacher.

*Boudoir Cap*, shown in Fig. 12a, supplementary

*Materials:* problem.

Flaxon, 25 inches on warp thread, 13 inches on woof thread.

Thread number 100.

Needle number 10.

Lace edging,  $2\frac{1}{2}$  yards.

Lace beading,  $1\frac{1}{3}$  yards.

Ribbon, 3 yards, number  $1\frac{1}{2}$ .

Embroidery floss, 3 skeins of Royal Society.

Embroidery needle number 8.

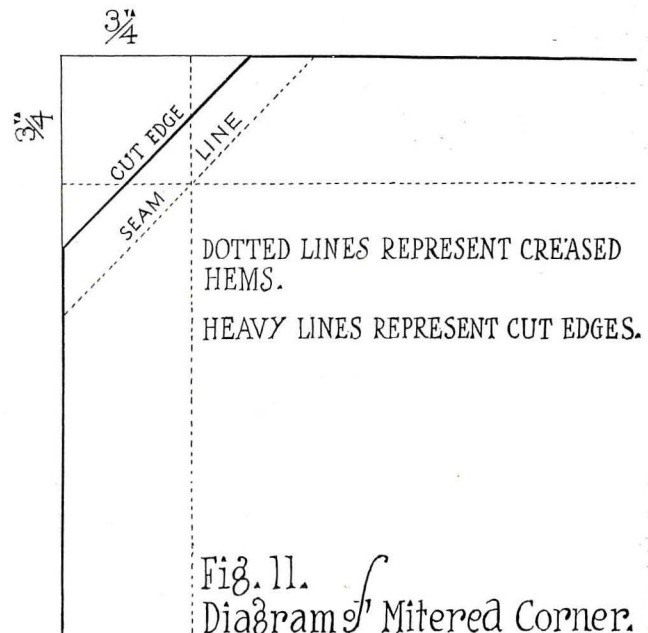


Fig. 11. Diagram of Mitered Corner.

*Steps in Construction:*

1. Embroider.
2. Place hem on edge.
3. Place lace edging.
4. Place lace beading on dotted line.
5. Insert ribbon.
6. Adjust to head and tie rosettes.

"There is pleasure in mere struggle, so it be not hopeless, and in overcoming resistance, obstacles and hardship. When to the pleasure of exertion is added the satisfaction of producing a new value, and the further satisfaction of earning a livelihood thru the new value, we have the common pleasurable conditions of productive labor. Every workingman who is worth his salt, I care not whether he works with his hands and brains, or with his brains alone, takes satisfaction, first, in the working; second, in the product of his work, and third, in what that product yields to him."

—Charles W. Eliot.





A Corner of the Lunch Room at Lunch Time.



The Waiting Line Outside the Lunch Room.

## COLLEGE WOMEN DIGNIFYING SERVICE

Ava B. Milam, Oregon Agricultural College, Corvallis, Oregon

**W**HEN everything was hustle and bustle and all the State Commissioners were racking their brains for plans to make their State building at the Panama-Pacific International Exposition the best and most interesting building on the grounds, and after having practically completed plans for the Oregon Building, the bright idea came to some Oregon Commissioner that the little corner left in the building might be turned over to the Home Economics Department of the Oregon Agricultural College. Here the college women might demonstrate some of the practical work along the line of foods taught in their college course, and incidentally, it might work out that these demonstrated products would occasionally take the place of wieners and coffee hurriedly snatched by the busy commissioners at the little stand around the corner.

This idea, tho hazy in their minds, when presented to President Kerr of the College and referred to the Home Economics School, was readily grasped as another opportunity to prove to the rather incredulous public the importance of Home Economics training. Immediately Mrs. Henrietta W. Calvin, at that time Dean of the School, and her co-workers, began to formulate plans for the organization of the work which later proved to be the great drawing card to the Oregon Building.

The plan worked out so that two senior women specializing in Institutional Management were chosen, one to have oversight of the kitchen and store-room, the preparation of food—she also made menus and did the ordering. The other was in charge of the dining rooms, was responsible for the service, had charge of the family accounts and laundry. Both

these young women were to remain until the close of the exposition, and each to receive \$50.00 per month and living. Fifty dollars was also paid to the woman engaged to do the dish-washing and mopping. All transportation and living expenses were paid for the 48 other girls, who received college credit in institutional management for each of the six weeks' work in the Oregon Building. These senior women were divided into groups of seven. The change of one-half of each group of students came every three weeks rather than the entire group at the end of six weeks. This made it possible always to have three or four students with three week's experience to work with the new girls coming in. During the entire time an instructor from the Domestic Science Department served in the capacity of advisor, each instructor remaining on duty one month.

What did the seven changing students do? They prepared and served breakfast and dinner to the Oregon family and their guests, numbering from 35 to 40. The Oregon family consisted of the State Commissioners and their families, the hostess, the guides, senior men from the Oregon State University and the Oregon Agricultural College, and the representatives of the various sections of the State who had charge of exhibits. They also prepared and served luncheon for eighty, the luncheon being opened for the public only and designed not for the same people, but for different ones. It was the desire of the department to make it an exhibit and to bring the work before as many different people as possible.

All the work, including the buying, planning, preparing and serving of these three meals, was done by the college women. Following are some of the typical menus:



<i>Breakfast*</i>		
Cantaloupe.....	.015	
Puffed Wheat.....	.005	
Cream.....	.02	
Sugar.....	.003	
Omelet.....	.039	
Toast, buttered.....	.013	
Jam.....	.01	
Coffee, cream and sugar.....	.025	.130
<i>Luncheon</i>		
Combination Salad.....	.049	
Cheese Souffle.....	.045	
Baked Potato.....	.01	
Rolls and Butter.....	.016	
Jam.....	.01	
Peppermint Ice Cream.....	.044	
Angel Food Cake.....	.01	
Coffee, cream and sugar.....	.025	.209
<i>Dinner*</i>		
Cream of Spinach Soup and Toast Sticks...	.02	
Roast Lamb.....	.12	
Currant Jelly.....	.005	
Peas, fresh.....	.027	
Browned Potatoes, with roast,.....	.01	
Bread and Butter.....	.021	
Caramel Bavarian Cream.....	.017	
Tea Cakes.....	.005	
Coffee, cream and sugar.....	.025	.250

\*Breakfast and dinner served to the Oregon family, the luncheon to the public.

All the meals consisted of three courses. Rather heavy breakfasts and dinners were served to the Oregon family, for they had to resort to "scones" or the like for luncheon.

You will note that meat, cheese and various types of fish souffles, Parker-house rolls and jams, were served at every luncheon. The souffles were far more popular than any meats served. The common opinion that cheese, the splendid and economical substitute for meat, is not liked is truly erroneous, as shown by the experience of the department, for cheese souffle and the Parker-house rolls gained great fame at the Oregon Building.

Businessmen from Oakland came as regular guests for the rolls until the lunch-room became so popular that by twelve o'clock no luncheon tickets were available—so long was the waiting line. A very particular woman, after having broken open one of the hot, airy rolls remarked to a friend sitting by her, "These belong to the Fine Arts Palace." The daily proposal usually came to the maker of the rolls.

As the duties were changed weekly, each girl received her share of proposals. Along with rolls, the famous loganberry deserves mention, for many a quart of jam accompanied by rolls disappeared at each luncheon.

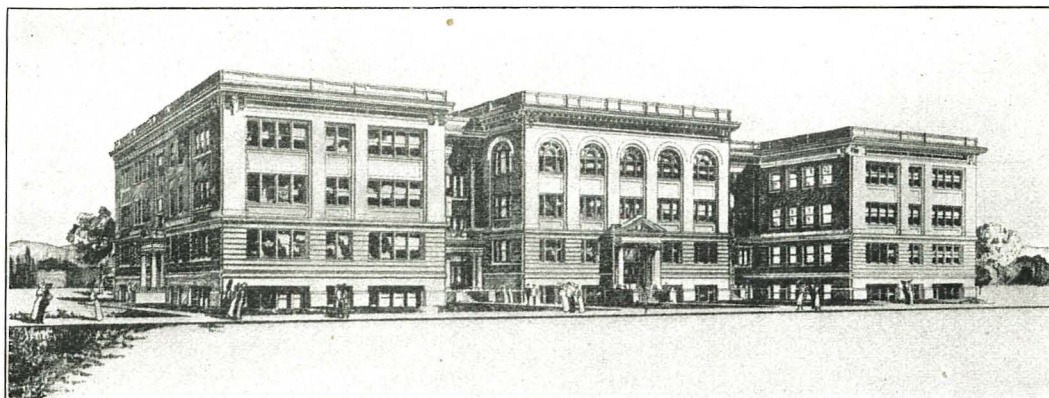
So much of the instructor's time at luncheon seemed to be demanded in telling how to make the favorite dishes that the department had recipes printed and gave them to the guests when requested.

Did these girls enjoy their work? Yes, they were most enthusiastic over it. They were chosen according to their standard of work and general qualifications, so that representing their college was an honor. The spirit was splendid, for they knew that the quiet, easy manner they assumed in their work, all of which could be seen by the public, not only brought their college before the public in a most favorable manner, but helped in the big movement for the dignifying of service.

It was not uncommon to hear a guest say, "I'm going to bring my daughter here, for I think these young women will be an inspiration to her." Not infrequently the statement, "I would give anything to have had such training in my college course," came from many a young married woman, after the instructor had explained to her the Oregon Agricultural College Course in Home Economics.

It was not only the good cooking that appealed to the public, but the sanitary conditions under which food was prepared were just as impressive. Many a man stopped to approve of the immaculate girls dressed in white, preparing food in a spotless kitchen, all of which could be seen thru the glass partitions. Men like to have their food prepared in a sanitary manner, and the one preparing it neat and tidy.

Governors, foreign and State commissioners, artists, authors, came and stood in line, and upon leaving were most elaborate in their praises; at times they were almost embarrassingly appreciative. It was a most democratic place, no reservation for luncheon being made for any one. The humblest guest was shown the same courtesy as the most distinguished visitor. This one factor added ma-



Household Economics Building, Oregon Agricultural College.



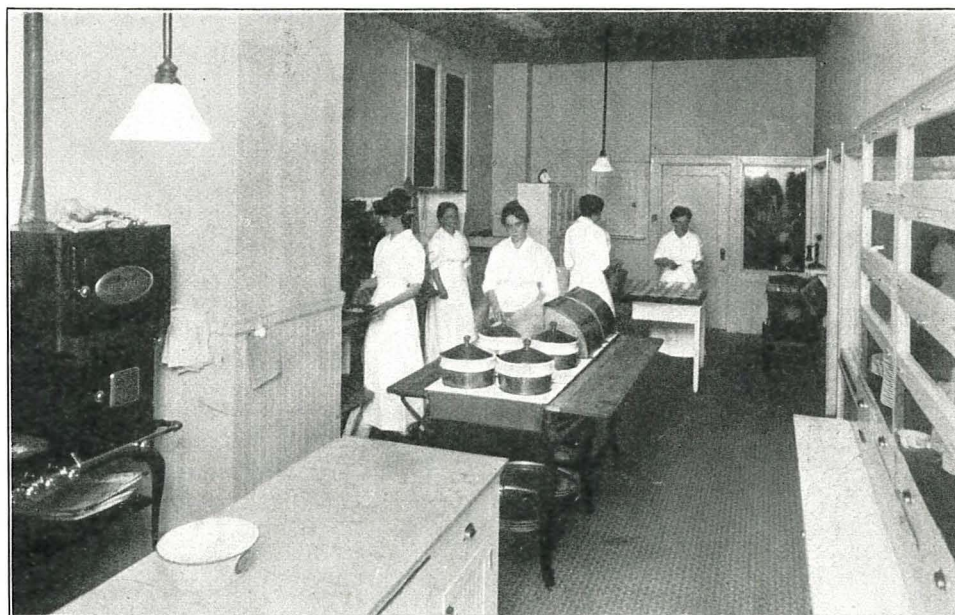
terially to the lunchroom's popularity. At eleven o'clock the line began to form and at five minutes of twelve, the tickets were distributed down the waiting line by a uniformed guide of the Oregon Agricultural College, who acted also as cashier.

The reader probably is wondering where these college girls and instructors lived, and if they had an opportunity to see the Exposition. They lived in the Oregon Building, in rather close quarters, the rooms being small and each occupied by two girls. The furniture was meager, consisting of double-decked beds which kept the girls in splendid athletic trim, and one small dresser to each room. They made the best of their surroundings, however, and

made the evenings by no means dull. It was not an outing in the usual sense of the word, for the girls worked harder than they ever had in their lives; however, they gained not only in experience, but also in pounds.

Many of the guests asked, "Who pays for this exhibit?" It did not occur to them that the 75-cent luncheons, and the breakfasts and dinners served to the Oregon family, paid not only the monthly bills of the department, averaging:

\$300.00, transportation of students and instructors,  
158.55, laundry,  
150.00, salaries,  
50.00, gas, water and light,



The Lunch Room Kitchen.

managed to keep in a good humor. Inns being the fashion on the grounds, each one of their rooms was named. There was the instructor's—Inquire Inn; while the students' were Tumble Inn, All Inn, Dodge Inn, Three Weeks Inn, Sleepy Hollow.

The work of these young women was so systematized that all were on duty for the preparation and serving of luncheon, while two alone prepared breakfast, three served, and the others were guests. The dinner in the evening was prepared by two who were guests for breakfast, so by rotation of duties the work did not grow irksome. Needless to say, speed was acquired by these young women; the preparation of a three-course dinner for forty demanded greater speed than is usually acquired in the laboratory practice. The plan also had its advantages in that it enabled the students to see the Exposition, the city, and the surrounding country. Trips to Tamalpais, Palo Alto, and several other places were planned for almost every girl. Concerts and theatre parties, with occasional visits in front of the cheerful fireplace,

50.00, concession,  
164.89, meat,  
111.66, vegetables and fruit,  
492.47, groceries,  
119.90, milk and cream,  
but still left a surplus averaging \$375.00 per month.

The next question which followed was, "What are you going to do with this money?" The explanation always came that it had not been decided. You see this surplus is a rather unexpected guest, and yet it has been greeted warmly, and ample provision will be made for its complete entertainment.

The desire uppermost in the minds of the people of the department at the present time is that it be added to the student loan fund of the Oregon Agricultural College, where it can be a source of help to many a worthy but needy young woman who is struggling for the completion of the college course in Home Economics.

The experiment, tho undertaken with some trepidation, has proved most gratifying to the department



in that it has helped to educate "the rather incredulous public" to the practicability of college training for the greatest of all professions—homemaking.

Recipes of Favorite Dishes Served at the San Francisco Lunch Room.

*Cheese and Tomato Souffle.*

2½ cups tomato puree  
7½ tablespoons butter  
7½ tablespoons flour  
2½ cups grated cheese  
7 eggs.

Cook in double boiler 20 min. Add grated cheese and stir until melted.

When cooled, add the well-beaten yolks of eggs, then fold in stiffly beaten whites. Bake in slow oven in a pan of water one and one-quarter hours.

*Peppermint Ice Cream.*

1 pint milk.  
½ lb. striped stick peppermint candy. Crush and dissolve in milk.  
1 pint cream.

Whip cream, and when the milk and candy are slightly frozen add the whipped cream and finish freezing.

*Rich Strawberry Shortcake.*

2 cups flour  
4 teaspoons baking powder  
¼ cup sugar  
½ teaspoon salt  
Few grains nutmeg

1 egg  
½ cup butter  
1¼ tablespoons lard  
½ cup milk

Mix dry ingredients and sift twice, work in shortening, add egg well beaten, and milk. Roll on floured board, put in baking pan and shape with hand to fit pan or cut with biscuit cutter into hearts or clover leaves with fancy cutter. Bake in hot oven twelve minutes. Split open and spread under layer with berries.

*Cheese Pudding*

8 small, thin slices of bread, buttered.  
¾ cup grated cheese.  
2 eggs  
1 cup milk  
½ teaspoon salt

Butter baking dish. Cut bread round to fit bottom of dish. Place in dish, add cheese, and cover with second round of bread. Mix egg, milk and salt and pour over contents of dish. Bake according to rules for baked custard, browning top slightly. Serve cold. This is an excellent luncheon dish.

*Parkerhouse Rolls.*

1 cup milk  
2 yeast cakes  
¼ cup lukewarm water  
Flour to make only as stiff as can be beaten.

2 tablespoons butter  
2 tablespoons sugar  
1½ teaspoon salt

Dissolve yeast in water to which ½ teaspoon sugar has been added. Scald milk in double boiler. Add butter, sugar and salt and allow to cool to lukewarm.

Combine milk and yeast mixtures and add flour gradually, beating vigorously to avoid lumps, until no more flour can be beaten in. Cover and allow to rise until three times the original bulk. Roll one-half inch thick. Cut, spread one-half with butter, and fold over.

Put in oiled pans, one inch apart. Butter tops, bake when light in hot oven, fifteen or twenty minutes.

*Cheese Souffle.*

2½ cups milk  
7½ tablespoons butter  
7½ tablespoons flour

7 eggs  
2½ cups grated cheese

Scald milk in double boiler.

Cream butter and flour, add to hot milk and cook until thick.

Add cheese and stir until well blended. When cool, add egg yolk and beat. Fold in stiffly beaten whites. Turn into a buttered baking dish and bake in a slow oven in a pan of water about one and one-quarter hours.

## A DINING TABLE

David Mitchell, Cleveland, O.



THE abundance of fruit and wine, together with the size and shape of the table, its carved claw feet, and its comfortable appearance seemed to suggest hospitality."

Students who have received instruction in the fundamentals of woodworking, and who have reached the specializing class, usually look around in search of something to make that will amaze the spectators, regardless of the benefits which may result to them thru the selected piece. The purpose of the student's selection of articles should be to put to further and better use, the fundamental principles of woodworking that he has so far acquired. The instructor's advice is very useful here and should be given after thoughtful consideration.

The dining table shown in Fig. 10, was made at the East Technical High School, Cleveland, O., and is very appropriate as a final problem. It contains most of the operations upon which the fundamental principles of

woodworking are based. The steps contained in its manufacture are:

1. Drawing.
2. Selection of wood.
3. Sawing.
4. Planing.
5. Joining.
6. Gluing.
7. Turning.
8. Carving.
9. Veneering.
10. Scraping.
11. Sandpapering.
12. Staining.
13. Filling.
14. Shellacing.
15. Varnishing.

In the construction of pieces of furniture a detail drawing, usually full size, should be made in order that the student may have a thoro conception of the article before work of construction begins. The preparation of the drawing, which represents the plan of the article in size and design, is followed by the construction of the

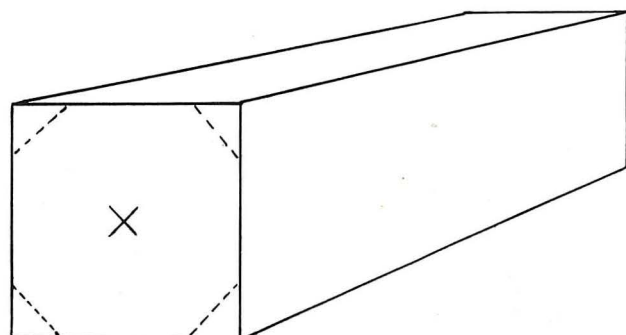


Fig. 2.

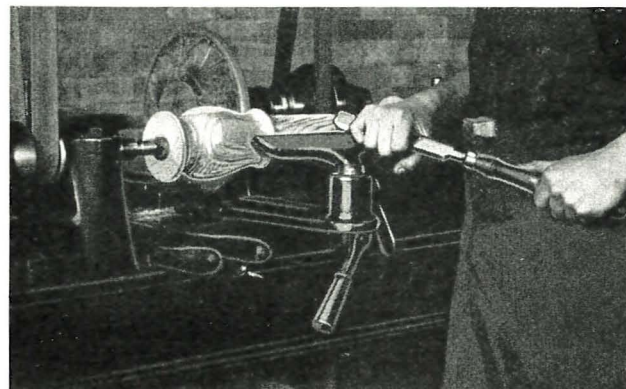


Fig. 3. Turning the Posts. Note position of tool and operator.





Fig. 1. Using Clamps.

parts making up the base and the center post. The pieces are sawed, planed, joined and made ready for gluing.

A preliminary coating of thin, hot glue should be applied where the end-grain is to form part of a glue joint. Clamps are used in the making of a glue joint. To expel the glue from the surfaces of contact, it is forced into the pores of the wood, and out on the sides of the joint. The clamps and the glue pot should be near at hand to give the worker an opportunity to act quickly. (See Fig. 1.)

The four corner posts are now turned on the lathe. The first operation in the wood-turning is to roughly turn the piece of wood to a cylinder. The extreme size of the piece makes it necessary to remove the corners, shown by the dotted lines in Fig. 2.

After the legs have been turned to shape, as shown in the drawing, the next step is to make the eight grooves.

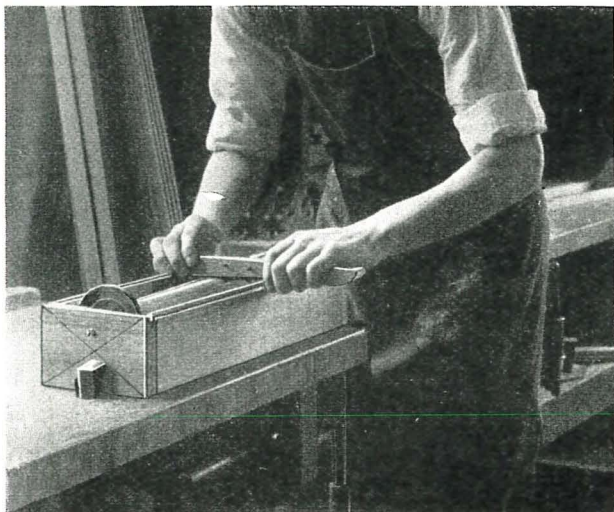


Fig. 4. Scraping Grooves.



Fig. 5. Carving.

This is accomplished by means of a piece of steel which projects out of the tool. The tool has for its guiding edge one side of a box, designed to hold the leg. The piece of steel serves the purpose of a scraper in scraping out the grooves (See Fig. 4). Much of the result depends upon the skill of the worker. It is essential that his mind should not wander but should be centered upon the work in hand.

The leg after being tightly clamped on the working bench, is ready for carving. Wood carving calls for the exercise of manual skill and artistic feeling. Students who have not the opportunity of watching an experienced wood carver at work, should try to secure a number of photographic illustrations showing the actual manipulation of tools. The worker must enter into the work with zest. The position of the worker and of the tool are shown in Fig. 5.

The overall shape of the claw feet is cut on the band saw (Fig. 6). The band saw is very useful for cutting irregular or curved lines. The stock to be cut is supported on the table and the guide is set as close to the work as possible.

The claws are now carved and attached to the base. The pedestal and the corner posts are connected with the base to the top board, with dowel pins. (Fig. 7.)

The rim is constructed by gluing together strips of

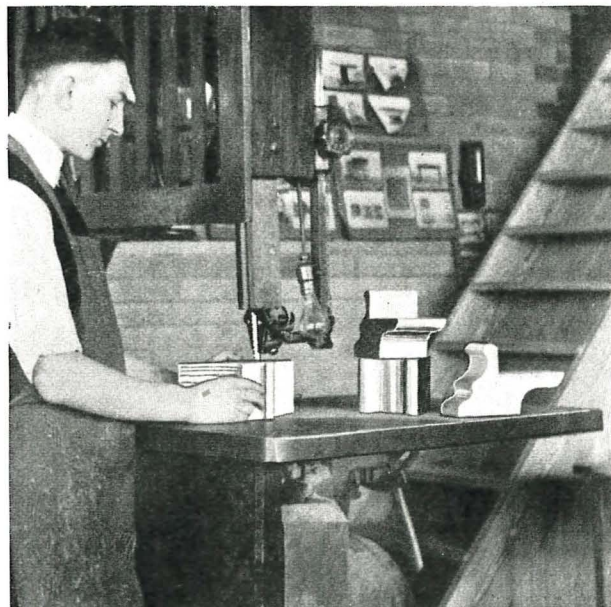


Fig. 6. Cutting Out Claws.



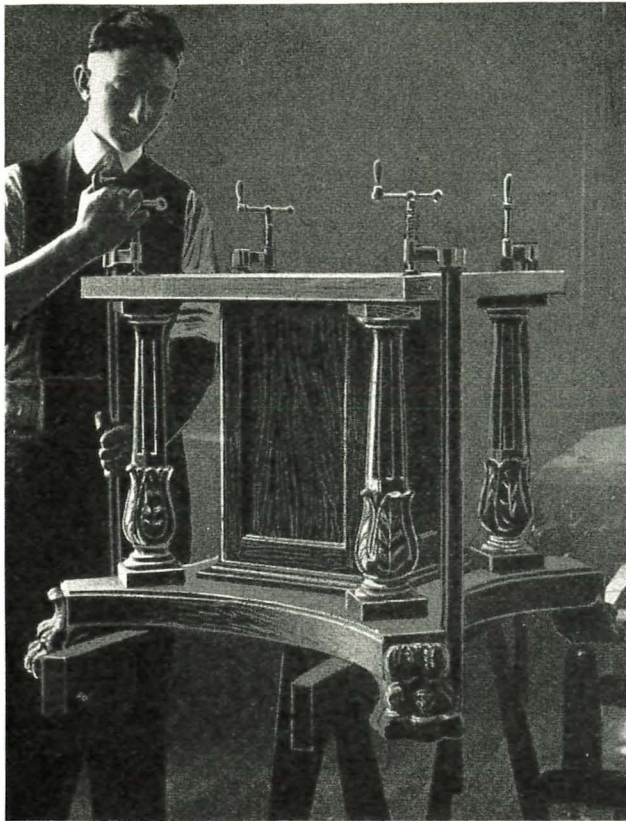


Fig. 7.

pine. The pieces should be one inch by one and one-half inches by twelve inches, and should be in three layers. (Fig. 9.) The rim is then smoothed, tooth-planed and veneered. The runners are now made and screwed to the top board parallel to each other.

If the table is to be of the extension type, the top should be divided into two equal parts. The parts should

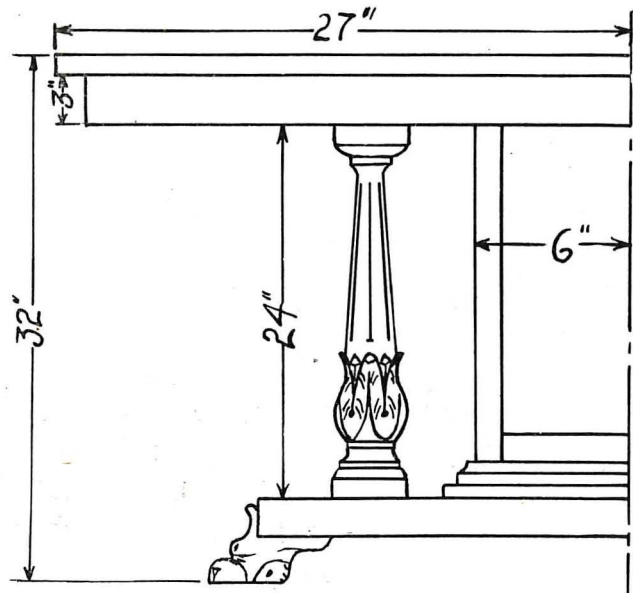


Fig. 8.

be cut to radius and the entire top should be screwed to the runners. (Fig. 8.) Care should be taken to have each half of the top slide easily.

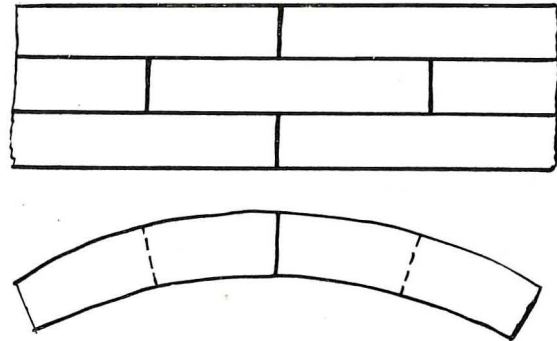


Fig. 9.



Fig. 10. The Completed Table.





No. 1



No. 2

Plate II.

## DRAWING IN CLAY

(Second Article)

Mrs. Mary F. Niles, Stout Institute, Menomonie, Wis.

### SQUARE PROBLEMS.

#### Problem 1.

##### Example 1.

Build piece by piece a two-and-one-half-inch cube. (Illustration plate 1, No. 1.) Build another cube, with a string or wire, cut from corner to corner, forming a right-angle triangle. (Illustration plate 1, No. 2.) Place this triangle on top of the first cube, forming the roof of a house, with projecting eaves. (Illustration plate 1, No. 3.)

The remaining half of the second cube can be used to form the roof of an addition to the house. (Illustration

plate 2, No. 1), which is a crude model made before the class to illustrate the problem. Time, five minutes. Additions may be built to the house, such as chimneys and steps. With a skewer draw windows, doors, stone foundations, bricks of the chimney and shingles: (Illustration plate 1, Nos. 3 and 4.) All sections of clay entering into the construction of the house are to be fastened together with the wood toothpicks.

Free play may be given the child's imagination. He will enter into the construction, either from photograph or from memory, with great glee.

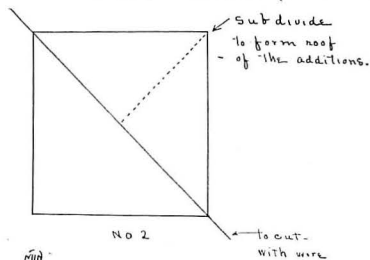
#### Problem 2.

##### Example 1.

Build piece by piece a cube three inches square (3 x 3 x 3). On one face of the square, one-half inch within the margins, draw a two-inch square. (Illustration

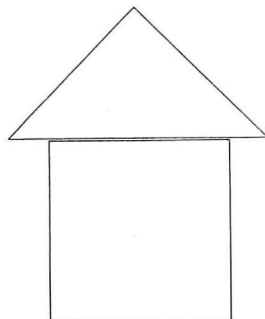


No. 1

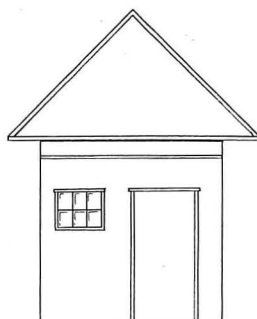


No. 2

Plate I.



No. 3



No. 4.



Plate I.

No. 4.

Plate I.



## Plate III

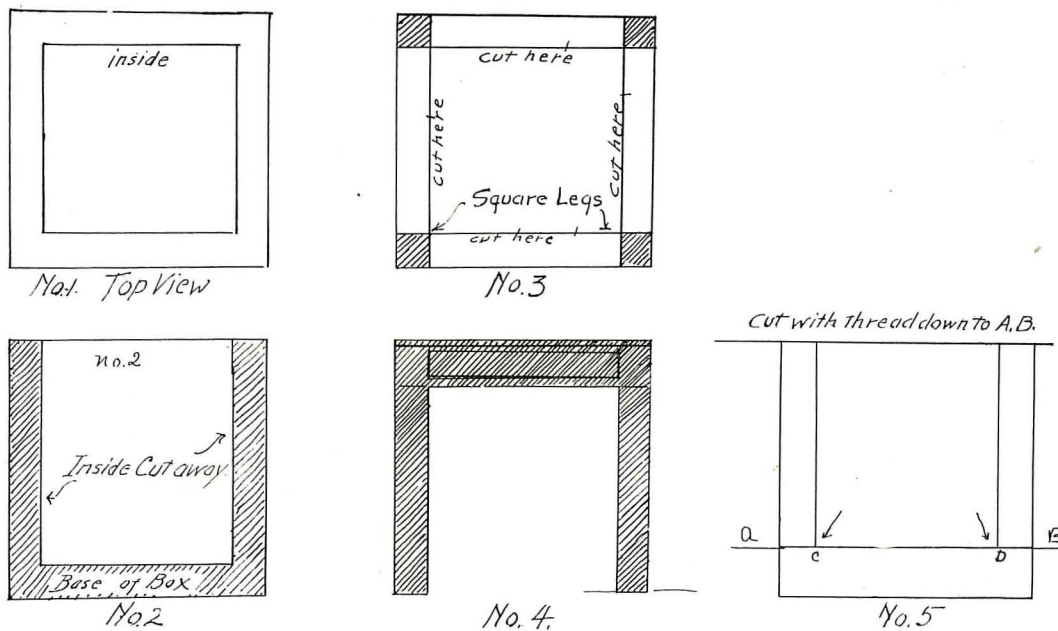


Plate III.

tion plate 3, No. 1.) Cut along the outline of this square, taking out piece by piece, to the depth of two and one-half inches, leaving a square box or dish, the walls of which are one-half inch in thickness. (Illustration plate 3, No. 2.) By this method other square dishes may be made, also boxes with covers. (Illustration plate 2, No. 2.) Covers are to be made by building as for tile, (Article 1, Part 1, February, 1915, INDUSTRIAL-ARTS MAGAZINE) from which cut a square three by three inches. Fit this as a cover to the box.

The object of these problems is the quickening of the observing powers and accuracy in the perception of form.

The following are some of the square problems that the children in the first five grades could make.

Inkwell.

Fern dish.

Pencil holder.

Cook stove.

Little benches.

Kitchen table.

The last named is shown in Illustration plate 3, No. 4.

*Method.* Build a cube one-fourth of an inch from the four edges of which draw four lines, (Illustration plate 3, No. 3). With a thread cut on the four lines to within three-eighths of an inch from the base. (Illustration plate 3, No. 5.) When the line A-B is reached, cut horizontally from C to D, taking out the clay from the center and sides, leaving the base and four corners. The latter serves the purpose of four legs to the table. (Illustration plate 3, No. 3.) Turn the table over and with a skewer mark the drawer and handle. (Illustration plate 3, No. 4.)

## Problem 3.

## Example 1.

## Square Tile.

On a sheet of manila paper draw a square five by five inches (5 x 5). Outline with a coil of clay one-half inch thick. Fill in the square to the required thickness, one-half inch, turn the tile over and finish the back.

If the tile is to be thicker, outline with a heavier coil of clay. Five-eighths of an inch is a good measurement, as some clays shrink one inch in seven, and the tile must not be too thin.

Another way of making a tile: Work the clay together firmly, into a large sheet, to the required thickness. Turn the sheet of clay over, filling all the cracks. See that there are no air bubbles. If there should be any pierce them with a skewer and fill in a bit of clay. Cut the tile from this sheet of clay, the size indicated above. When the tile is finished to a good surface, turn the tile over and score the back, to prevent warping. (Illustration plate 4, No. 2.) Put the tile away to dry to leather hardness, then apply design. (Illustration plate 5, No. 1.)

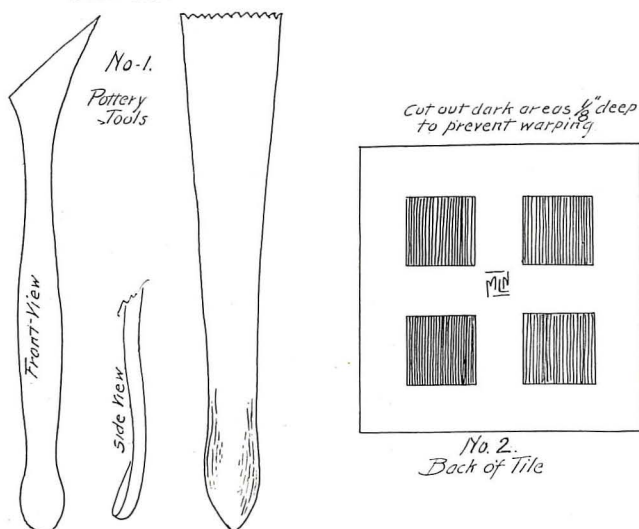


Plate IV.



All tiles should be put away to dry under a weight to prevent warping. Turning the tile every day will prevent warping.

For fireplace tile, one method is to roll out the clay with a rolling-pin. See that all air bubbles and cracks are filled, then cut with a square tin cutter, just as a housewife would cut cookies.

This is not a public school method but might be of interest to manual training students, as commercial fireplace tiles are made by the above method, then finished by hand, glazed and fired.

In a later article the subject of the glazes and the firing will be taken up.

#### *Application.*

Tea tile, illustration plate 5, No. 1.

Ornamental tile, illustration plate 6, Nos. 1 and 2.

Fireplace tile, illustration plate 5, No. 3.

Fireplace tile may be ornamented with any appro-

strain comes on the corners of any square dish in the shrinkage during the drying and in the expansion in firing.

The four sections of the side walls can be attached to the base, one at a time, or all four at once, after having joined the four corners. In either case the base of the side walls, also the corresponding attachment on base of dish (Illustration plate 7, No. 1), must be scored and left rough and ragged so that the clay will be thoroly incorporated, one piece with the other. Repeat the process for the upper section of the side wall. (Illustration plate 7, No. 5D.)

The upper section may be vertical as indicated by the dotted line (Illustration plate 7, No. 5), or joined by plain mitre at their corners after a very little clay has been removed (Illustration plate 7, No. 5), also (plate 5, No. 2) making the box a little smaller at the top.

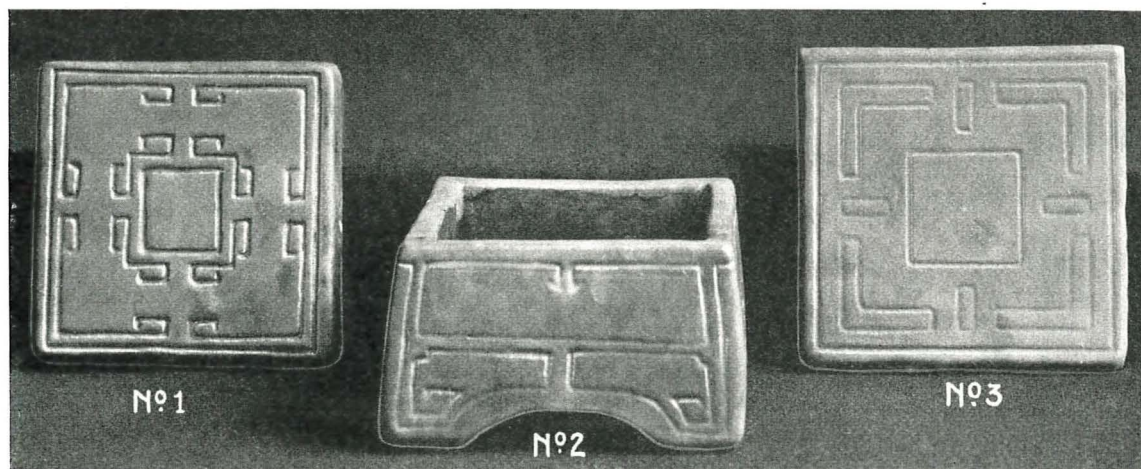


Plate V.

prate design or may be glazed with colors harmonizing to the color scheme of the room, and left undecorated.

#### **Problem 4.**

##### *Example 1.*

##### *Fern Dish.*

(Illustration plate 5, No. 2.)

On manila paper, draw pattern for the fern dish, five inches square and three inches high (5 x 5 x 3). Build base as for tile one-half inch thick. (Illustration plate 7, Nos. 1 and 5a.) Allow one-half inch for thickness of feet (Illustration plate 7, Nos. 5b and 7), leaving two inches for height of side walls. (Illustration plate 7, Nos. 5 C and D.) Piece by piece, build four strips of clay four and one-half inches long, one-half inch thick and one inch wide. These strips must be uniform. Then by either of the two methods (Illustration plate 7, Nos. 2 and 3) fasten the corners together.

If the corner butt is used, then the measurement as above stated should be used. If the plain mitre, then the strips must be five inches long.

To fasten together, score deeply and firmly, and fasten two sections together. (Illustration plate 7, No. 4A.) With a skewer or pottery tool (Illustration plate 4, No. 1), work the two surfaces solid, as a very great

#### *To make the feet.*

Build four little squares two inches square and one-half inch thick (2 x 2 x 1/2). On two sides of a square, one and one-fourth inches from the corner base (Illustration plate 7, No. 7), draw a curve to the upper end of the square. Cut away the clay. (Illustration plate 7, Nos. 5B and 6). The only surface of the foot that touches the table is the dark portion. (Illustration plate 7, No. 6.) The portion of the foot that attaches to the base of dish remains two inches square, but is very thin at A and B. (Plate 7, No. 6).

To fasten the feet to the dish, score the feet very deeply (Illustration plate 7, No. 7), also the corresponding four corners of the fern dish, base, and press them firmly together.

Good finish and true drawing of the right angular corners must be maintained.

When the feet are finished, turn the fern dish over and support the base (center) by a little square of clay the thickness of the feet, else the base would sag with its own weight. Finish with a line design, glaze and fire.

It is always safer to fire to a bisque before glazing any square problem, because in applying the glaze to



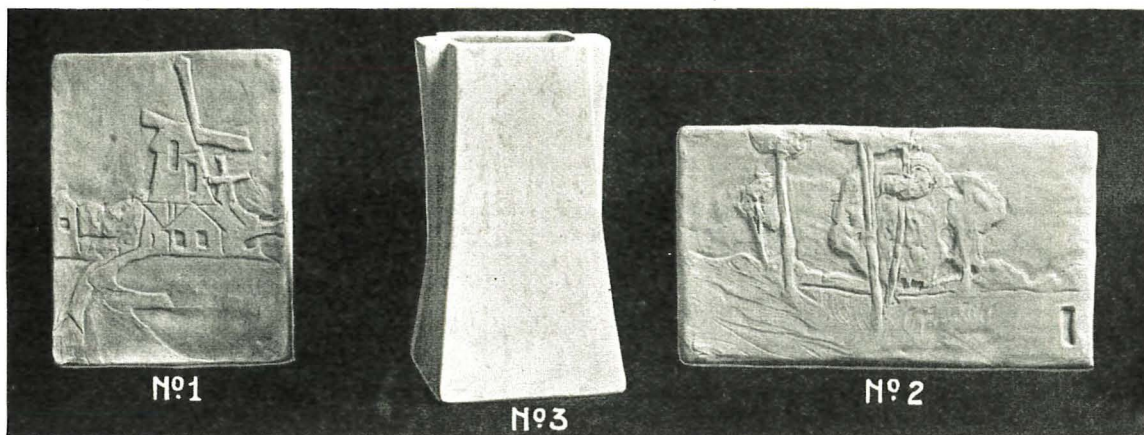


Plate VI.

raw clay the corners are liable to crack. In the making of a fern dish, the walls may be vertical, flare out or pull in a little. The feet may be of any desirable proportion.

Good design is of first importance, not even subordinate to utility. By design is meant construction as well as decorative design. By utility is meant fitness to purpose.

Any other square dish may be made by the above method. (Illustration plate 6, No. 3.)

These problems are for the upper grades and the high school, provided that suitable preparation has been given in the lower grades. In the study of the square problems, consideration must be given to the differing angles, and adequate illustration furnished.

For the triangle beech-nuts and Brazil-nuts make

an interesting illustration. They can be modeled on a plinth, then glazed and fired, making a good looking, as well as an instructive model, with which the children are delighted.

The beech-nut forms an excellent motif for design.

Follow the use of the triangle thru historic ornament, in floor mosaics, and stained glass windows, as well as in the rhythmic repetition of a unit in modern design.

In nature we find a beautiful illustration of the triangle in the three-petaled, deep blue flowers of the spiderwort (*tradescantia Virginica*) and in the nodding "Wake-robin" (*trillium grandiflorum*) of which Mr. Ellwanger speaks—"The chaste pure triangles of the white wood lily."

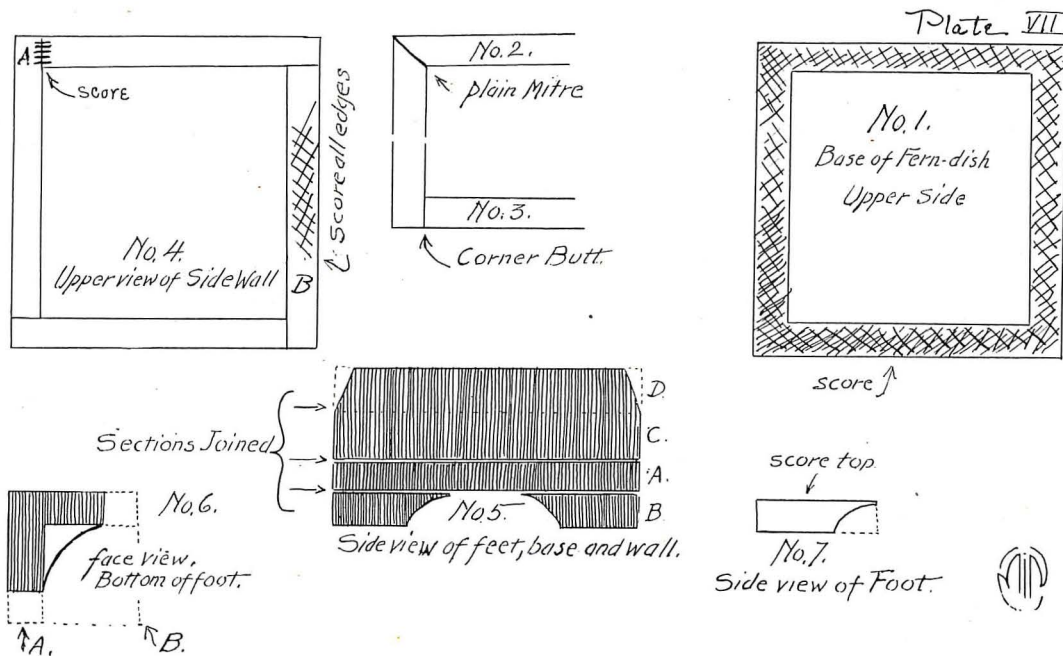


Plate VII.



# INDUSTRIAL-ARTS MAGAZINE

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## EDITORIAL

### MEN AND EQUIPMENT.

Those who are administering industrial schools would do well to consider one thought quite carefully. Equipment and buildings will not make a great school. They are merely the tools which are to be used by someone in making a school. The factor which determines quality of product is not the tools that are at hand, but the skill and character of the mechanic who uses the tools.

The same holds true in a school. The men and women who are to use the building and equipment as tools in shaping the lives of young people, are the important consideration. In establishing a school, therefore, the first essential is to gather a group of eight or ten first-class men or women who have had experience and know their business, and put them on the job. We wonder what kind of an industrial school eight men, each worth and paid \$4,000 a year, would establish. It is our guess that no matter what kind of an equipment was provided, such a group would make a school of more than exceptional efficiency.

One weakness of many large schools is that the man at the head tries to be the only star performer in a three-ring circus, forgetting that the show with only one star performer is never a success as a three-ring affair. There are a number of conspicuous examples of this character in the country, city and state systems, in which no one seems exceptionally capable but the chief. Such systems soon go to pieces and the chief himself suffers by it. Great leaders not only inspire greatness in their subordinates but they recognize it and reward it when they find it.

### COMPARISONS.

In a report of a certain school system the figures regarding retardation are given in a table containing similar statistics from ten other cities of about the same size. Because the city in question is near the top in the table, the conclusions given are to the effect that the city schools are in excellent condition. We realize that a whole lot of irrelevant thoughts find their way into our consciousness and that the following is perhaps one of that kind, but it seems in some respects to be analogous.

A certain man had a pain or ache somewhere in his anatomy. The physician who was called in made

a careful examination and gave the patient a statement to this effect: "You have a pain in your system but according to a system of measurements which have been developed, I find that your system is 90 per cent efficient. Your neighbor in the flat next door has a similar pain but his is worse than yours. The man up on the next floor has one not quite so aggravated, and the man in the next block has an ache much more severe, etc., etc. Therefore, because your complaint is not so bad as most of the men have in this neighborhood, and only one is in any better shape, I conclude that nothing needs to be done to relieve you."

### THE DOLLAR MARK.

During a recent convention one of the speakers thrilled part of his audience with a phrase to this effect: "God forbid that we should ever place a dollar sign above the doorway to our schools! The education which whispers 'put money in thy purse' is an education for savages." A little later in his address the speaker said that we need an education which will make for better homes, better food and improved living conditions. These desirable conditions which are generally conceded to be the chief purpose of education are all to be gotten by the expenditure of dollars, and the education for good food, homes, and living conditions is an education for what dollars represent. Dollars are only a medium of exchange, and are valuable only so far as they can purchase the necessities or luxuries of life.

### SOME DISCUSSIONS.

Doctrinaires of education have spent much time in recent years discussing such topics as "Children take greatest interest in the things that interest them most;" and "Why boys prefer to do what they have the greatest preference for."

Just recently, certain of these people have been trying to prove by a kind of juggling of figures, that the introduction of industrial and vocational courses has not tended to increase the school attendance. Apropos of such discussions, the following from the "San Francisco Call" should make interesting and profitable reading:

"A hundred pupils were disappointed in their hopes of registering at the Oakland Technical High School this morning because they were not in the party that camped all night at the institution or took the first cars today.

"When the enrollment of new pupils began at 9 o'clock, four hundred young persons were in line. There are accommodations for but three hundred over the number in attendance from last term.

"Almost a score of boys and girls were shivering outside the building when the cars stepped running last night. The girls were accompanied by their mothers. The camping out equipment consisted of



thermos bottles, automobile robes, pillows, lunch baskets, lanterns and ukuleles.

"At midnight Superintendent of Schools Barker heard of the army investing the high school, had the janitor aroused, the classrooms opened and the furnaces started. The prospective pupils nodded in the schoolroom seats the remainder of the night.

"The registering began this forenoon in the order of appearance in line. The school has a capacity of over 1,700."

#### A PREVOCATIONAL ACCIDENT.

In a recent address Lorado Taft, the sculptor, related an incident of his school days which illustrates how an apparently unfortunate accident resulted in just the opportunity which he needed to fix his purpose on sculpture as a profession. Said he: "I well remember how the privilege of mending a broken plaster cast under the direction of a sculptor man gave me the first incentive toward sculpture. We had looked forward to the coming of a collection of casts of the masterpieces of sculpture which had been ordered from abroad by our College president. At last they came, and we opened the great boxes of old world art with reverence. When the Laocoon was uncovered it was found to our dismay that it was broken into a thousand pieces. A sculptor man was sent for and I was chosen to help him assemble the broken fragments of the pathetic Trojan Priest and his sons. After many hours of work we got it together with the exception of a few yards of snake, which was eventually supplied, and the group showed little evidence of the disaster which had befallen it." "But," said Mr. Taft, "from that experience I had learned to love the plastic form of sculpture. I had visions of the figures of history which never had come to me before. The power of the sculptor to personify and vitalize his ideals comes only after years of patient study and labor, but the incentive which makes such study and labor possible and enjoyable may come with the opportunity to slide off the school bench and get one's fingers into some kind of manual work."

#### UNWARRANTED CRITICISMS.

For some peculiar reason, there are people in the trades and industries who, if judged by their expressions, would seem to be the natural enemies of the public schools. Such persons have been untiring critics of the various courses in the schools as "impractical." They frequently tell how "we do it" and how "we learned the trade." They charge the courses cannot be practical, because the teachers are impractical.

But when the schools get practical teachers and get down to really effective work, the above mentioned critics turn about and scoff at the "idea of young high school boys and girls turning out such

work!" With an air of wounded pride, they recall "the long apprenticeship *we* had to serve, and the years of struggle *we* had to go through."

Finally, not realizing the contradiction in the argument, they cast doubts upon the authenticity of students' work and intimate that it must have been done by the teachers—those impractical teachers.

Fair minded people will be willing to grant the possibility of unusual work by ambitious young men and women in our good high schools. When such young people devote several hours daily for two, three, or four years to specialized work in Architectural Drafting or similar lines, it is but reasonable to assume that they gain a body of knowledge and training not lightly to be thrown aside or scoffed at.

Now, let us get to the remedy. First, there has been much truth at the basis of both these attitudes. But the proper thing for those who would criticise, is to *find out* about the actual conditions, before offering wholesale condemnation. It would be very easy to find out the facts.

Secondly, it would be well to recognize the fact that there are some advantages after all, in the modern way of teaching the elements of the various trades. It may as well be recalled further that in the apprenticeship systems in which "we" were trained, there were many disadvantages and frightful wastes of time and energy.

Third, let those who, out of experience and observation find defects in the courses and methods of the schools, go about in a genuine spirit of co-operation to help to remove the defects. The public schools are everybody's schools. Hence everybody should be proud of their successes and deeply concerned at their failures.

I believe that harmony is the law of life and is fundamental in the Divine economy; that man expresses this law of harmony, which is beauty, in proportion to its possession of his consciousness, and his response to it in his daily living. I believe that the quality of harmonious relationship existing between colors and forms, or between the parts and the whole, or between the worker and his material, in any field of labor, constitutes Art. For Art to appear in the works of man, or for him to appreciate its presence, it must be there as a working element in both his conscious and unconscious life. It must be the cause, and not the effect, of harmonious living and working. I believe that the realization of one's ideals in any material form is that man's highest Art expression, and that his understanding of its Beauty is the highest form of his Art appreciation.

—Frank Alvah Parsons.

Teachers need the encouragement of a supervisor to lean less and to stand on their feet more.  
—William McAndrew.



# PROBLEMS AND PROJECTS

THE Department of Problems and Projects, which is a regular feature of the INDUSTRIAL-ARTS MAGAZINE, presents each month a wide variety of class and shop projects in the Industrial Arts.

Beginning with January 1, 1916, the Magazine will award a monthly prize of \$10 for a meritorious problem used in the Department. This is not a prize contest in the ordinary sense. Every problem accepted for publication will be paid for. The prize will be simply a reward of merit.

From the material submitted by readers, the Editors will select each month for the award one problem of especial merit, judged from such standpoints as originality, good construction, artistic merit, adaptability to school work, and quality of drawings and photographs submitted.

The brief description of constructed problems should be accompanied by a good working drawing and a good photograph. The originals of the problems in drawing, design, etc., should be sent.

Problems in *benchwork, machine shop practice, turning, patternmaking, sewing, millinery, forging, cooking, jewelry, bookbinding, basketry, pottery, leather work, cement work, foundry work*, and other lines of industrial-arts work are eligible for consideration.

Drawings and manuscripts should be mailed flat and should be addressed:

The Editors, INDUSTRIAL-ARTS MAGAZINE,  
Milwaukee, Wis.

## A NEW DURABLE LOOM FOR PRIMARY WEAVING.

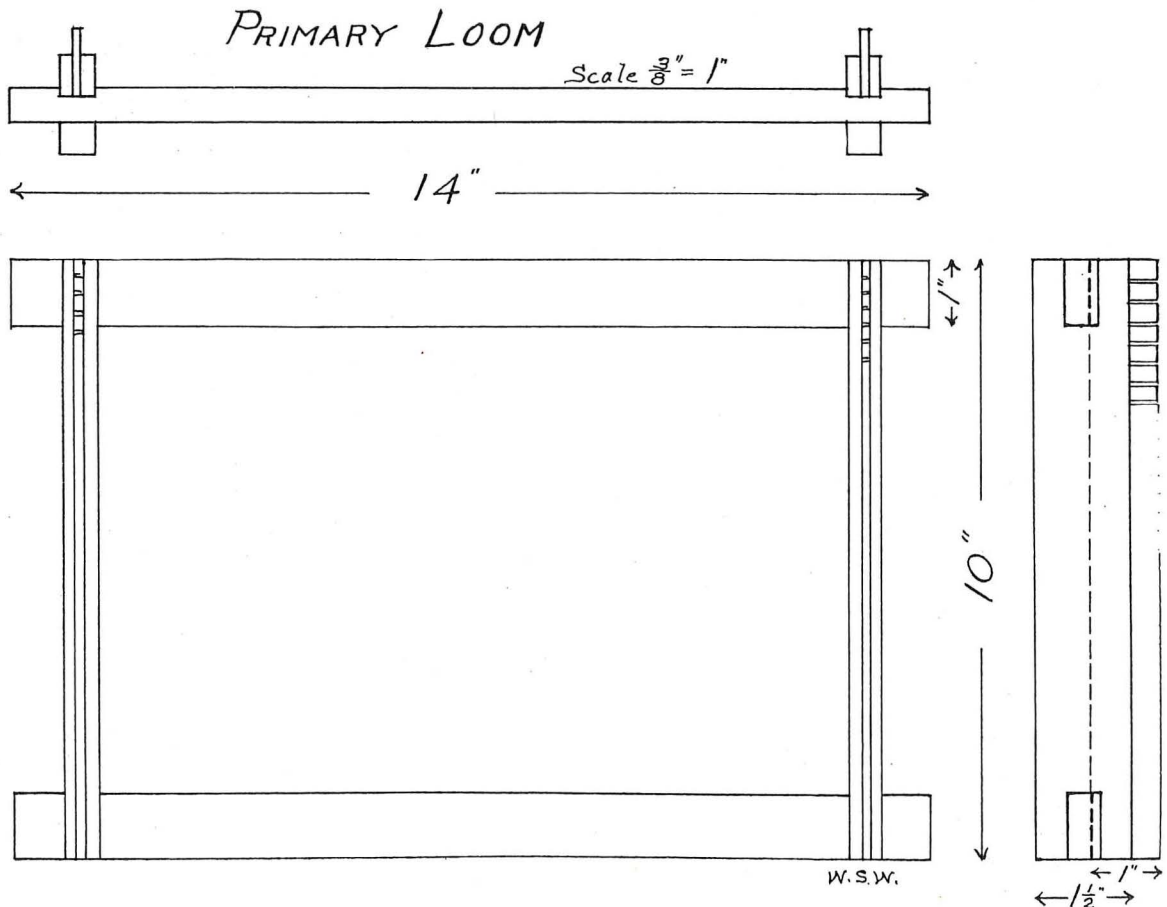
W. S. Wright, Supervisor of Manual Training,  
San Diego, Cal.

Several years ago I "bumped" into a problem in economy that seemed to deserve a little study. This particular problem was presented in the looms for primary weaving. Strawboard looms had been in use and were far from satisfactory. They served once and were thrown away, because they lacked rigidity and several other necessary qualifications.

Our first attempt at a remedy resulted in a loom made by the boys. A thin board was fastened to two 1"x2" strips, with nails driven into the top edge on which to string the warp. These were an improvement but were still far from satisfactory. One objection was "first cost." They were constantly in need of repair, and they scratched the furniture.

Last year the problem became really serious when the Arts and Crafts Supervisor asked for 2,000 new looms suitable for use in either the first, second or third grades. An investigation showed that we could not purchase looms such as were needed for less than 25 cents each. The bill would be too high under the circumstances, so we began to study and experiment with the result shown in the accompanying sketch.

The looms could not be made profitably except in shops equipped as ours are with machinery. All the machine-work is done on "circle" and band-saws. By using the mitre-saw for ripping, no jointing is necessary. The dado attachment with a jig cuts the gains in the rails; another jig and set-up is required for slotting the stretchers. The groove which holds the "comb" is cut with a dado scoring blade after the parts are assembled. The "comb" itself is entirely





worked out on the band-saw. Two by ten birch or maple stock is cut across the grain into pieces about one inch long; the spaces are laid off and the slots are cut, using a stop fastened to the table to regulate the depth of the cut. These pieces are split into strips (combs) one-eighth inch thick, and driven into the groove in the stretcher. A heddle is made in the same manner, thus completing the loom.

In practice it is found that no operation involved is too difficult for seventh or eighth-grade boys, while the assembling can be done easily by boys in the sixth or even the fifth grades. The cost is about five cents where new lumber is used thruout; in our case the cost was much less as a great part of the material was salvaged from the scrap pile.

Cabinets to hold fifty looms are to be made by the eighth-grade boys, the finish in each case to conform to the finish of the room in which it is to be placed.

Some of the advantages presented by this loom are durability, lightness, simple construction, no metal parts, no nails to mar furniture, glue being the only fastener necessary. They can be made and stored in the "knock down." As the assembling of fifty looms is scarce half an hour's work for a class of fifteen or twenty boys, a hurry order can be filled immediately.

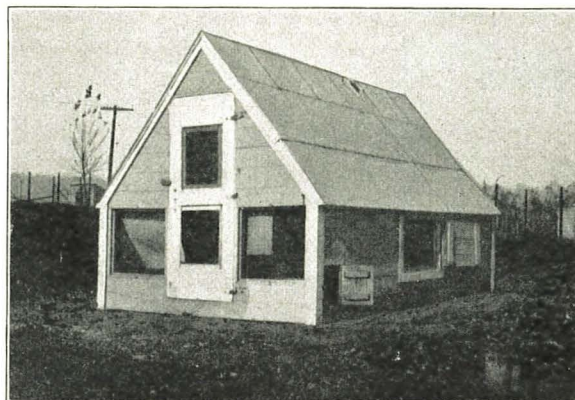
For a shuttle our supervisor prefers a five-inch bent sack needle, but wooden needles can be easily made in case they are desired.

We have made the most of our opportunities to study factory methods and the boys have been keen to see the advantages as well as some of the disadvantages of such methods. What is probably more to the point is the fact that we have, in a small way, been able to "justify our existence." The Board of Education is naturally well pleased to get a 25-cent article at less than bargain counter rates.

#### A MOVABLE POULTRY HOUSE.

Wm. E. Frudden, Charles City, Ia.

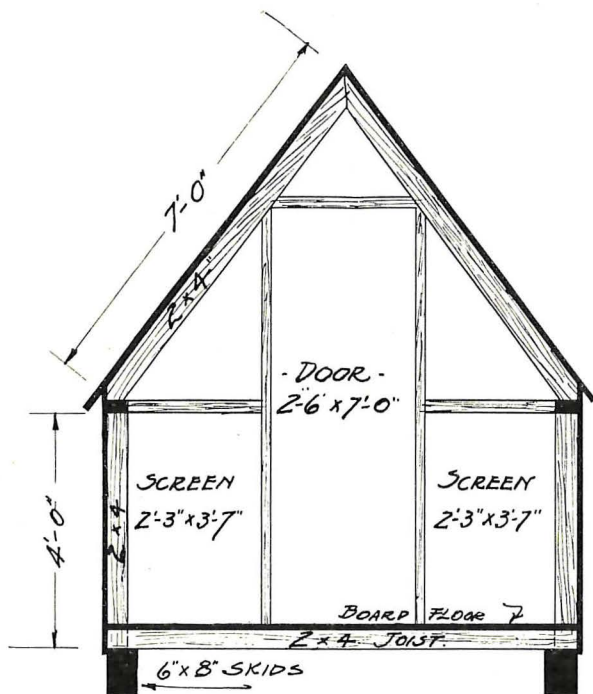
For ages poultry raising has been an important branch of agriculture but in no time in the history of the world



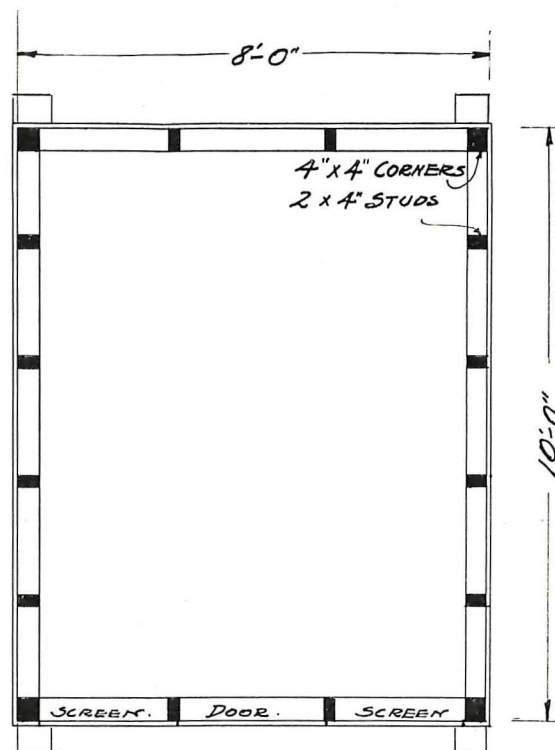
Completed Poultry House.

has as great interest in poultry husbandry been indicated as now. Any person, whether he be the owner of a farm, or occupant of a village property with a back yard attached, can take part in this profitable and pleasant industry either for commercial gain or to reduce living costs thru a private supply of fresh eggs and meat. High-class stock of a good laying strain are essential in the egg business, but all is in vain, even proper feeding, if the question of housing is overlooked. It pays immensely to have the right type of house, tightly constructed of durable materials and equipped with an open front for light and ventilation without the dangerous drafts.

The movable coop shown here is cheap. It is light, has been thoroly tried out and found to be very satisfactory for raising chicks in flocks of two hundred to three hundred. It will winter from 20 to 30 hens. The house has materials in it that cost about \$30, and if the instructions are followed any average person can put the materials together. It is an eight by ten-foot house, built on 6 by 8-inch skids or



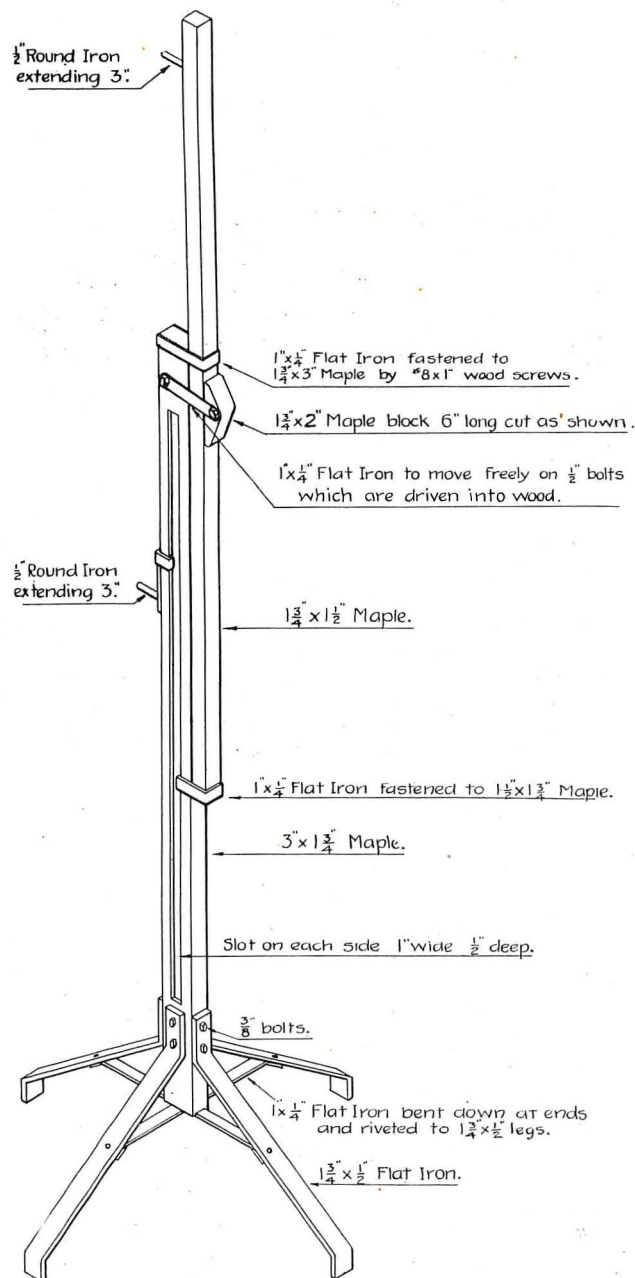
CROSS SECTION +



- FLOOR PLAN -

A Movable Poultry House.





JUMPING STANDARD  
FOR POLE VAULT AND HIGH JUMP

runners, which furnish the foundation for the house and make it possible to easily move the structure from place to place. It is warm and the fowls are well protected from drafts. It is convenient and a minimum of work is required to care for the flock.

The material, that is, the lumber that is needed for this \$30 coop is listed herewith. Each item required is named so that you can easily tell just where each is intended. The two skids are 12 feet long, projecting a foot at each end of the floor. All the framework for the house is made of "two by fours." The floor joists are two feet apart and run crosswise from one runner to the other. It is best to build the structure on some level platform or barn floor. The floor joists are eight feet long and covered with ship-lap for flooring. The side-wall studdings are four feet in length. They rest directly upon the skids, are spiked to the sides of the joists and toe-nailed into the runners or foundation. The floor-plan drawing shows where the wall studdings are placed. Six will be required for each side, but at the corners

double them, to make the coop firm and rigid so that it will not rack itself out of shape when it is being moved about from place to place. Around the top of the wall studding, run a two by four-inch plate, spiked well into the top of the studs. This makes a bearing plate for the roof rafters. All the framework is placed two feet apart, the joists, the studding, and the rafters. The rafters which form the foundation for the roof are seven feet long, placed at half pitch.

When the frame is complete and well braced cover the floor, walls and the roof with an eight-inch ship-lap lumber, well nailed, with two ten-penny nails at the crossing of each rafter and studding. The roof is then made waterproof by applying a three-ply grade of felt roofing material, well lapped and cemented at the joints. In the south front is a large size door, and at each side are screened openings covered with muslin cloth. In the rear gable end is placed a small hinged window which will be opened only at times when the house needs airing. A small hen door is placed along one side wall near the floor line. The roosts are built in along the rear end-wall and nests can be made to fit along both side walls. Keep the place clean at all times. Make it a weekly chore to thoroly clean and disinfect the whole place. The job of curing a sick fowl is almost more than a man's-size job. It is prevention that pays big here and an ounce of it is worth pounds and pounds of cure. Whitewash the inside walls twice a year and keep the place in a spick and span condition if it is big profits that the poultry man is after.

Materials required for the 8 by 10-foot house:

- 2 pes. 6 x 8 12 ft. for skids.
- 6 pes. 2 x 4 8 ft. for floor joists.
- 16 pes. 2 x 4 4 ft. for wall studding.
- 2 pes. 2 x 4 10 ft. for wall plates.
- 2 pes. 2 x 4 7 ft. for studding.
- 2 pes. 2 x 4 8 ft. for end wall plates.
- 12 pes. 2 x 4 7 ft. for roof rafters.
- 500 board feet 8-inch ship-lap for floor, walls and roof.
- 1 1/2 squares three-ply roofing material.
- 1 door 2 1/2 by 7 ft. screen for front.
- 2 screens 2'3" by 3'7" for front.
- 1 sash, 3 lights 8 by 10 inch for rear gable end.

#### A FOLDING JUMPING STANDARD.

J. H. McNeely, Director of Mechanical Drawing, Hollywood High School, Los Angeles, Cal.

The jumping standard shown is one of two which were built by the boys in the shops of the Hollywood High School. The design, which is original, is the work of the Mechanical Drawing Department of the school. The standards have been in use on the athletic field for some months now and are giving excellent service.

This standard possesses many advantages over those on the market at the present time. The automatic lock which allows the adjustable upright to be raised at will, by merely lifting the weight of the upright, prevents absolutely any movement in the reverse direction. The lowering of the upright can only be accomplished by lifting the lock.

In the operation of the standards in a contest it is necessary to raise the bar, which two of these standards support, from two to six inches at a time. This is very readily done since it is only necessary to lift the adjustable upright the corresponding amount, e. g. four inches as indicated on the scale marked in feet and inches on the bottom of the slots in the sides of the stationary uprights.

The pegs for the high jump are unique in design. The advantage claimed for the design shown is that the pegs cannot be lost and that the pegs must remain in a horizontal position. The peg is securely fastened to a place which is T-shaped, the top being bent around on both sides to fit into slots in stationary upright. The peg passes thru this



plate half an inch and fits rather loosely into holes bored every inch in the upright.

Both the wood and the metal work on the standard is exceedingly simple and easily performed by high school boys. The result is a very substantial standard which is able to withstand the constant abuse which it is almost sure to receive.

The wood of this standard is given three coats of linseed oil and two coats of shellac and then one more of linseed oil. The iron received three coats of spar varnish mixed with lamp black, and a little whiting to give it body. Both wood and iron are carefully sanded between coats.

### BILL of MATERIAL for JUMPING STANDARD

Number required	Kind of material	Size of material	Cost.
1	Common iron	1 x $\frac{1}{4}$ " — 11" long.	.04
1	"	" 9"	.03
1	"	" 8"	.03
2	"	" 1'-8"	.12
2	"	" 6"	.04
4	"	$1\frac{3}{4}$ x $\frac{1}{2}$ " — 2'-2 $\frac{1}{2}$ "	1.05
2	"	$1\frac{1}{2}$ x $\frac{1}{4}$ " — 3"	.03
1	"	4 x $\frac{3}{4}$ " — 4 $\frac{3}{4}$ "	.09
1	Maple	$1\frac{1}{2}$ x 2" — 6'-8"	.16
1	"	3" x 2" — 6'-0"	.29
1	"	2" x 2" — 6"	.02
3	Bolts and Nuts.	$\frac{1}{2}$ " x 5"	.04
4	"	$\frac{3}{8}$ x 5"	.04
1	Bolt	$\frac{1}{2}$ " x 6"	.02
8	Iron rivets	8 x 1"	.01
18	Wood screws	$\frac{3}{8}$ x 1"	.04
4	Iron washers	$\frac{1}{2}$ "	.01
1	Wood screw	$\frac{3}{8}$ x 2"	.01
	Paint		.25
	Total Material		2.32

The range for pole vault is from seven to thirteen feet; for the high jump, from three feet to six feet, six inches.

The cost of material is shown to be \$2.32. The saving, when compared to dealer's price, is striking and the durability and convenience of this standard surpasses the commercial one.

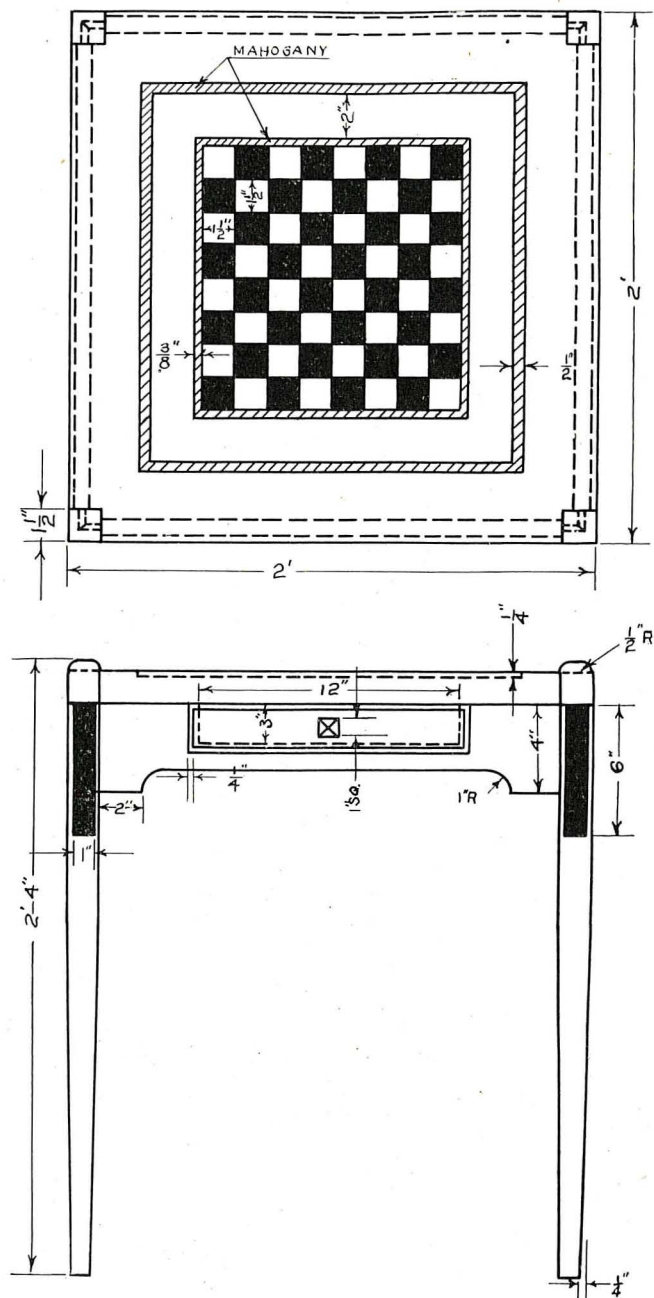
### INLAID CHECKER-BOARD TABLE.

Milford G. Fox, Madison, Wis.

In this table is shown genuine inlay work, and not the imitation kind which is produced by stripping.

A wide choice in the different colors of wood may be used in this problem. But whatever group is used one must constantly keep in mind that open and close-grained woods do not expand and contract equally at the same degree of humidity. I have found that the following combination produces excellent results. The foundation of birch, the squares of black walnut, and the strips of mahogany. In choosing the birch one should be careful to pick material with an even grain. The top should be built up by glueing strips together, so as to prevent warping. Special care should be given to see that the grain runs all the same way.

When the top has been squared to the required size, the checker-board is laid out on its surface with a knife, taking particular pains to see that all dimensions are correct. After determining that all lines are in their correct place, score each again with a very sharp and fine-pointed knife. This produces a permanent outline for work. With a sharp chisel dig out every alternate checker in the first row to the depth of about a quarter of an inch, keeping the sides at right angles to the top, and still retain the edge produced by the knife line. The black squares of walnut are now squared to within a thirty-second of an inch of their required size. With a sharp block-plane, a fine stroke should now be taken



Inlaid Checker Board Table.

off from the lower edge on all four sides of each piece. This will admit them into the opening without friction, and the pieces constantly become tighter as they are forced down. I found it wise to leave the walnut blocks three-eighths of an inch thick, allowing a little to plane off. After the first four have been glued in place, let them dry at least two hours, as there will be a tendency to crowd in the corners if the glue is still soft. Each of the following rows should be placed in the same manner.

After the work has dried for twelve or fifteen hours, the squares should be planed down to approximately the surface of the top. The mahogany strips can now be placed in their proper position, without danger of moving any of the walnut blocks. If care has been taken to see that the grain all runs in the same direction there will be but little difficulty in finishing the surface. The blocks in the legs are inlaid from black walnut in the same manner as the squares in the top. The checkers are turned out on the lathe from mahogany and birch.



This piece should be finished with white, transparent shellac and varnish. When it is worked down to a smooth hard surface, the shellac and varnish brings out the beautiful color in the mahogany and walnut, and leaves the clear surface of the birch in its natural richness.

I have found this a splendid problem for especially skilled students in the junior or senior high school classes.

#### A SAFETY PUSHER.

Joseph J. Eaton, Director of Industrial Arts, Saunders Trades School, Yonkers, N. Y.

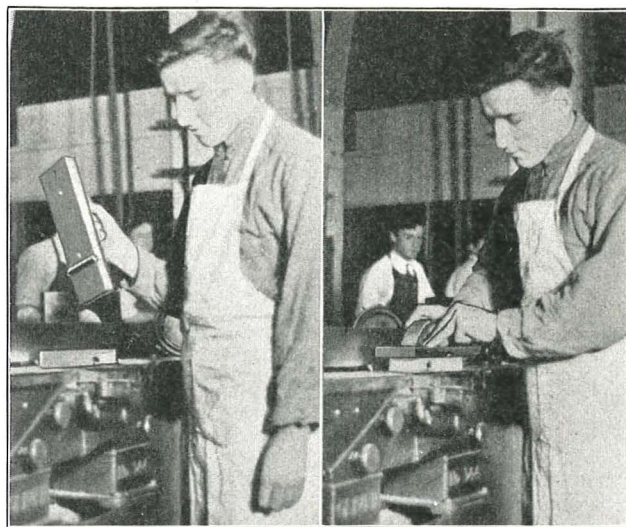
Teachers of shop work in school shops using power machinery for shaping wood will probably be interested in a device made by Alfred J. Bate, teacher of patternmaking in the Saunders Trades School located at Yonkers, N. Y. This is only one of the many devices designed or adopted by the teachers of this school for the protection of the pupils.

This one in particular consists of three pieces of wood, as may be seen from the picture accompanying this article. At first sight it looks something like a scrubbing brush or like a plasterer's "float."

The body is made of a piece of  $\frac{7}{8}$ " wood about 4" wide and 12" long. A handle is strongly fastened to the back and underneath is a small cross strip. The cross strip is dovetailed into the body, eliminating nails and screws. The wood to be planed is placed on the jointer in the usual manner; (it may be noted here that this device is particularly for short pieces of wood), the handle grasped in one hand; the body of the device is placed flatly upon the upper surface of the wood to be planed, and by moving the whole part forward, the checking strip underneath comes up against the end of the wood. The wood to be planed may be pushed over the cutter head.

There seems to be little possibility of one's fingers slipping off the wood with disastrous results to the worker. The idea is passed along for the benefit of any who may care to use it.

A RECENT report of the Carlisle Indian School states that nineteen Carlisle students are taking a student's course in the Ford Automobile Works in Detroit. They are required to attend night school and to observe the general rules of the "Outing System." Concerning these Carlisle Indian students, an officer of the Ford Company says: "They have shown more than the average aptitude and



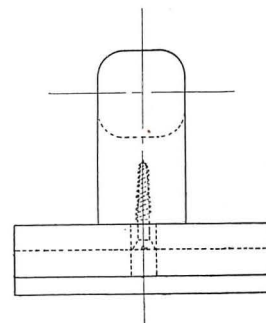
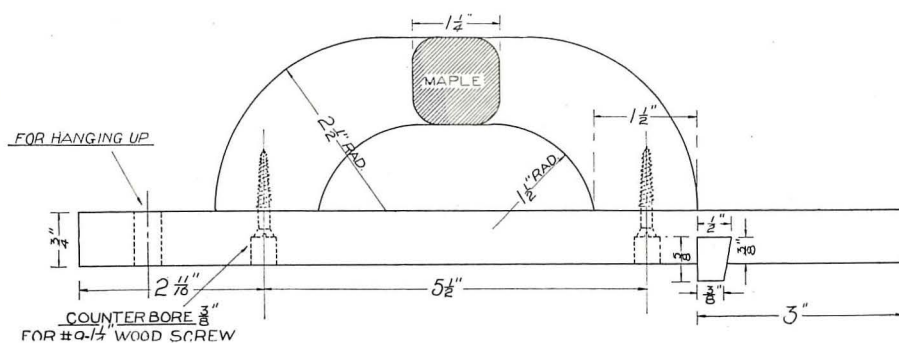
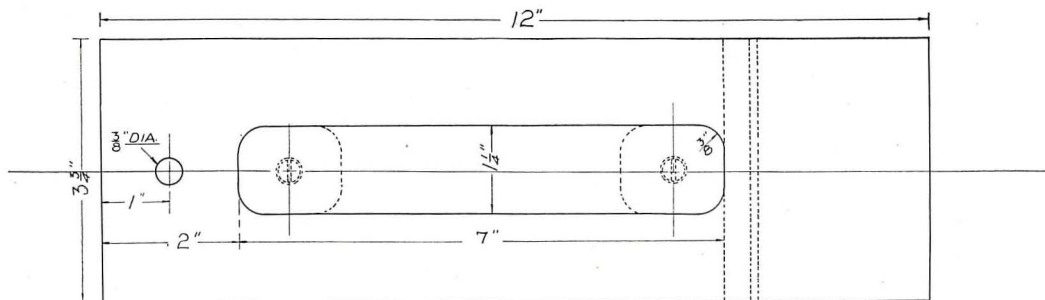
The Pusher in Use.

have made better progress than the average student taking similar courses in our works. We have been impressed with the concentration they show, their regularity of attendance, and the patience and determination they exercise in mastering all the details of the work with which they come in contact." Other students are to be placed in similar large plants as opportunity affords.

THRU the efforts of Roy V. Ellise, superintendent of schools of Troy, Mo., manual training was introduced in the schools this year. Domestic science was introduced last year, while teacher-training was begun two years ago. A stereopticon for visual instruction has been in use for some time. Troy is the smallest community in Missouri to boast all of these departments in the schools.

DANBURY, CONN. A course in millinery has been introduced in the evening school. The classes are under the direction of Miss Helen Norris, Supervisor of Domestic Science.

IN his recent annual report, Supt. Edward J. Tobin of Cook County, Ill., says that field and garden school-home projects have been introduced in the school courses. Twenty-five hundred pupils cultivated land rented from their parents and took the work as a regular school subject. One boy made \$370 from an acre of pickles. The total amount earned exceeds \$15,000.



SAFETY PUSHER



# ITEMS OF CURRENT INTEREST

## COLLECTING LUMBER BILLS.

In our November issue a correspondent asked for hints as to methods of collecting lumber bills in the school shops. A large number of replies were received and some very suggestive methods suggested. Space is not available for publishing all of the blanks submitted and methods proposed, but the following may be of assistance to teachers dealing with the problem.

Mr. Clyde A. Bowman, Director of Manual Arts in the State Normal School at Stevens Point, Wis., uses a method as follows:

"Each student, before getting out stock for any problem, makes out a list of required material in finished sizes. He checks from the stock list as he gets it out. He adds one-fourth of the total board feet in the finished sizes to cover waste. This is an easy and accurate way of knowing just where the lumber and material are going and it requires that the pupils read the drawing of an object intelligently. So far, he has had no objections of any kind from the pupils to the method.

"We have used this scheme with pupils from both the normal and the continuation school. In some cases the normal schools make their own drawings, working from prints made of previous work done in the drawing classes. In the latter cases, the stock lists are especially useful, as it is necessary to think out the whole problem to make out the list."

The stock lists used by Mr. Bowman provide a place for the name of the student, the time required on the job, the kind of lumber and the cost per board foot, together with space for the thickness, width and length of every piece of lumber used in the project. Space is allowed for computing waste and for filling out the total board feet and the cost of the lumber.

Mr. Clarence A. Van Kammen of Kalamazoo, Mich., writes that for two years he has found that a most satisfactory method is to have an understanding with the boys that no work is to leave the shop until paid for. When the piece is completed, the boy figures out the bill for the material used, including any he may have spoiled. The instructor and the boy check up the results in order that there may be no errors. At the same time that the lumber is paid for, the boy is given his mark or grade on the finished problem. Each boy on completing his working drawing makes out a stock bill of the material required in the exercise. This bill is pasted on the reverse side of his drawing.

The lumber room is in charge of a stock boy. Each boy, when he wants a piece of lumber, takes his drawing to the stock boy and tells him what piece or pieces he desires. The boy gets out the stock and signs his name as a check on the pieces given out. If a piece is spoiled a new piece must be had. This must be noted on the stock bill and is checked out by the stock boy and the number of feet in this piece is placed under "feet spoiled." This "feet spoiled" item is checked on the record card. A new stock boy is placed in charge of the lumber room each week.

The cost check in connection with the stock bill furnishes quite an interesting problem. The boy keeps a record on the back of his drawing paper on both the regular and extra hours he works. When the exercise is completed the time is transferred to the cost check. It is decided what the boy is worth an hour in the particular work he is doing, and the cost of time is added.

Mr. Van Kammen states that he finds the boy develops a sense of responsibility and a greater appreciation of the work when he has computed the entire cost of his work.

Mr. Clarence T. Mudge, Supervisor of Industrial Arts in Eugene, Ore., describes his plan as follows:

"At the opening of the term, I post a full list covering the materials, for instance:

Oak.....	10c per ft.
Maple.....	8c per ft.
Screws.....	1c per doz.
Sandpaper.....	1c per sheet.
Finish.....	1c per sq. ft.

"I then appoint a foreman and stock-keeper for each class. I also provide some blank requisitions for the class. When a boy desires a piece of lumber he fills out his requisition and takes it to the foreman of his class, who looks it over and O. K.'s it by his signature. The boy takes this to his stock-keeper, who selects the board and checks his lay-out in order that there may be no mistake.

"At the end of each week I take these requisitions and charge them against each boy and when the article is completed, I have no trouble in collecting. In my three years here I have had only one bill not paid.

"I do not try to collect the money myself but use the enclosed blank. You will see by this that the matter of collection is in the hands of a district clerk. No articles are allowed to leave the finishing room until the boy returns the receipt signed by the clerk."

Mr. Meyer Goldman of Norma, N. J., describes his method as follows:

"The problem is indeed a difficult one because one runs the risk of endangering the educational value of this work every time he enters into a business transaction with the boys coming from poor homes. It is not fair to ask the boy to agree to carry out a contract when conditions necessary for the fulfillment of this contract are not in his control.

"We are situated in a village four miles from a town, consequently our lumber must be purchased in large quantities.

"When the boy has decided upon his project he makes out a lumber order on a blank furnished him. This is examined for correctness and then transferred to a regular shop bill, the boy taking part in this operation as far as he is able, figuring out the number of board feet, etc. He is then given a copy of this bill, a duplicate of which is kept on file, and is allowed to get out his stock with the understanding that he will pay for this lumber the next time he comes to school for a lesson, otherwise he is not permitted to go on with his work.

"If, for any reason, there is any doubt about paying, the pupil is advised to consult with his parents after the bill is made out, before giving the stock."

Mr. J. A. Williams of Dixon, Ill., has slips printed with perforated stubs with space for the name of the pupil, the name of the instructor, kind of material to be used, cost, and total, with a space for the signature of the parent or guardian.

The instructor fills in the slip, sending it home by the boy. When the boy returns the slip signed by the parent, with the amount due, the slip is stamped paid and given to the boy as a receipt.

Mr. H. B. Kendrick has a somewhat different scheme for collecting his bills which he describes as follows:

"I had a local print shop bind, in book form, a receipt with stub. On this I had the name of the department, a blank line for the date, and another line for the boy's name. Under the boy's name, I had \$1.00 material fee and under this a place for the teacher's signature. All around the margin I had placed such numbers as 1, 3 and 5,



Several teachers write that they withhold the grade of the pupil until all materials used in the shop have been paid for. This scheme may serve to make the boy pay his bills, but would seem to place an undue emphasis upon the value of the grade.

Robert W. Schneider, Director of Industrial Arts, Deerfield-Shields High School, Highland Park, Ill.

The large card, five inches by eight inches, is a permanent record and its usefulness does not end when the boy graduates, or leaves school to enter some other occupation. It contains a complete record of the boy's work in the Industrial Arts department, and shows what courses were taken, when, amount of time credited, grades received, and high school credits earned. It shows also what set of drawing instruments, or tools, he was responsible for at the time, what parts were lost, broken, or otherwise spoiled.

If the boy does not go to college he probably applies somewhere for employment. The probable employer makes

<u>Earl Ritts</u>						
Cases	Description of Project	Time In hours	Material	Amt. and Cost.	Total Cost Paid	Lens, Broken, Spilled
Jainery	Tobaret	18 H.Ook	4 @ 8¢	\$ .36 ✓		
	Revolving Book Case	83 F.Ook	21 @ 8¢	\$ 2.16 ✓		
	Floor Top Desk	12 P.Ook	42 @ 8¢	\$ 3.36 ✓		
	Mallet	4 Maple	1 @ 10¢	\$ 1.0 ✓		
Cab. Mfg.	Library Table	11 P.Oak	34 @ 12¢	\$ 2.55 ✓		
	Jewelry Box	9 Mahogany	12 @ 5¢	\$ .23 ✓		
	Waste Basket	7 P.Oak	3 @ 12¢	\$ .23 ✓		
	Music Cabinet	32 P.Ook	22 @ 12¢	\$ 1.65 ✓		
	China Closet	48 F.Oak	14 @ 12¢	\$ .05 ✓		1/2 Similar 8¢ ✓
	Bassinet	8 @ 6¢	\$ .48 ✓			

Name	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11	No. 12	No. 13	No. 14	No. 15	No. 16	No. 17	No. 18	No. 19	No. 20	No. 21	No. 22	No. 23	No. 24	No. 25	No. 26	No. 27	No. 28	No. 29	No. 30	No. 31	No. 32	No. 33	No. 34	No. 35	No. 36	No. 37	No. 38	No. 39	No. 40	No. 41	No. 42	No. 43	No. 44	No. 45	No. 46	No. 47	No. 48	No. 49	No. 50	No. 51	No. 52	No. 53	No. 54	No. 55	No. 56	No. 57	No. 58	No. 59	No. 60	No. 61	No. 62	No. 63	No. 64	No. 65	No. 66	No. 67	No. 68	No. 69	No. 70	No. 71	No. 72	No. 73	No. 74	No. 75	No. 76	No. 77	No. 78	No. 79	No. 80	No. 81	No. 82	No. 83	No. 84	No. 85	No. 86	No. 87	No. 88	No. 89	No. 90	No. 91	No. 92	No. 93	No. 94	No. 95	No. 96	No. 97	No. 98	No. 99	No. 100	No. 101	No. 102	No. 103	No. 104	No. 105	No. 106	No. 107	No. 108	No. 109	No. 110	No. 111	No. 112	No. 113	No. 114	No. 115	No. 116	No. 117	No. 118	No. 119	No. 120	No. 121	No. 122	No. 123	No. 124	No. 125	No. 126	No. 127	No. 128	No. 129	No. 130	No. 131	No. 132	No. 133	No. 134	No. 135	No. 136	No. 137	No. 138	No. 139	No. 140	No. 141	No. 142	No. 143	No. 144	No. 145	No. 146	No. 147	No. 148	No. 149	No. 150	No. 151	No. 152	No. 153	No. 154	No. 155	No. 156	No. 157	No. 158	No. 159	No. 160	No. 161	No. 162	No. 163	No. 164	No. 165	No. 166	No. 167	No. 168	No. 169	No. 170	No. 171	No. 172	No. 173	No. 174	No. 175	No. 176	No. 177	No. 178	No. 179	No. 180	No. 181	No. 182	No. 183	No. 184	No. 185	No. 186	No. 187	No. 188	No. 189	No. 190	No. 191	No. 192	No. 193	No. 194	No. 195	No. 196	No. 197	No. 198	No. 199	No. 200
1	1/2	16 7/8	31 5/8	46 1/2	61 1/4	76 1/4	91 1/4	106 1/4	121 1/4	136 1/4	151 1/4	166 1/4	181 1/4	196 1/4	211 1/4	226 1/4	241 1/4	256 1/4	271 1/4	286 1/4	301 1/4	316 1/4	331 1/4	346 1/4	361 1/4	376 1/4	391 1/4	406 1/4	421 1/4	436 1/4	451 1/4	466 1/4	481 1/4	496 1/4	511 1/4	526 1/4	541 1/4	556 1/4	571 1/4	586 1/4	601 1/4	616 1/4	631 1/4	646 1/4	661 1/4	676 1/4	691 1/4	706 1/4	721 1/4	736 1/4	751 1/4	766 1/4	781 1/4	796 1/4	811 1/4	826 1/4	841 1/4	856 1/4	871 1/4	886 1/4	901 1/4	916 1/4	931 1/4	946 1/4	961 1/4	976 1/4	991 1/4	1006 1/4	1021 1/4	1036 1/4	1051 1/4	1066 1/4	1081 1/4	1096 1/4	1111 1/4	1126 1/4	1141 1/4	1156 1/4	1171 1/4	1186 1/4	1201 1/4	1216 1/4	1231 1/4	1246 1/4	1261 1/4	1276 1/4	1291 1/4	1306 1/4	1321 1/4	1336 1/4	1351 1/4	1366 1/4	1381 1/4	1396 1/4	1411 1/4	1426 1/4	1441 1/4	1456 1/4	1471 1/4	1486 1/4	1501 1/4	1516 1/4	1531 1/4	1546 1/4	1561 1/4	1576 1/4	1591 1/4	1606 1/4	1621 1/4	1636 1/4	1651 1/4	1666 1/4	1681 1/4	1696 1/4	1711 1/4	1726 1/4	1741 1/4	1756 1/4	1771 1/4	1786 1/4	1801 1/4	1816 1/4	1831 1/4	1846 1/4	1861 1/4	1876 1/4	1891 1/4	1906 1/4	1921 1/4	1936 1/4	1951 1/4	1966 1/4	1981 1/4	1996 1/4	2011 1/4	2026 1/4	2041 1/4	2056 1/4	2071 1/4	2086 1/4	2101 1/4	2116 1/4	2131 1/4	2146 1/4	2161 1/4	2176 1/4																																																						

Above (left) Front of General Record Card and (right) back of same card showing courses and projects. Below (left) Typical Time Cards and (right) backs of time cards with time distribution.



inquiries at the school. Reference to the card tells immediately not only what the boy did while in school, but also what grade of work he is capable of doing.

The time card, three inches by five inches, serves for one semester only and is filed for future reference. It takes the place of the time card or punch clock in a commercial establishment.

The boy makes daily entries on the front of the card, failure to do so being counted as absence from class by the instructor. The double spaces, under each day of each week, may be utilized in various ways. If the work is done in double-period sessions, as was the case in the cards here shown, each space may mean one period, while if the class meets for only a single period each day the second space may be used to record extra time, such as work after school or during free periods. This card, too, shows the amount of time spent on school projects, and in helping others.

The back of the card contains a record of the projects made, when each was begun, when completed, and the total number of hours needed. The marking is as follows:—*Music Cabinet*—9-4—14-4—52. It means that the project was begun on the fourth day of the ninth week, was completed on the fourth day of the fourteenth week, and required 52 hours of work. The front of the card will also show this. In the case of a course in drawing, the back of the card is used in the manner indicated in the second card of this size shown above.

Besides being merely a record for reference, the cards have another value. The instructor is frequently called upon to make reports for the school or other institutions, to prepare papers for club meetings, to compile statistics for various purposes, or to make estimates for supplies for the following year. This form of record gives him much of the needed information.

#### KEEPING CHILDREN IN SCHOOL.

By a very simple method, the school authorities of Rochester, N. Y., have enlisted the large industries of the city in an effort to keep young people in school.

Mr. Alfred P. Fletcher, Assistant Superintendent of Schools, wrote letters to all of the large industries of the city asking them to telephone to the Board of Education when in need of young workers, allowing the school authorities to recommend one or two applicants.

Mr. Fletcher offered to furnish each firm with cards with the following printed on it:

"At the present time this firm is only employing workers under 18 years of age recommended by the department of public instruction. If you desire a position, we would suggest that you communicate with Raymond C. Keople, 308 Municipal Building."

The school printed the name of the firm on the card and the cards were supplied free of charge to those firms who signified their willingness to give them out.

As a result of this action, over fifty firms consented to co-operate with the school authorities, and a very large number of young people soon presented themselves at the office of the department of education to find out how they might get in line for positions.

Special classes were formed for these persons, and short-unit trade courses designed to fit them for some position, were given.

#### LABOR UNION CONDUCTS OWN SCHOOL.

A local union of the International Association of Machinists in Los Angeles, California, has established a school which is unique in its organization according to the account of C. F. Grow and Walter Webster, published in the January issue of the *Machinist's Monthly Journal*.

The members of the union have opened a shop in which they have installed complete equipment for a machine-

shop. It is the intention to make the school equal to any school teaching machineshop work. The shop takes an amount of work, at standard rates, paying wages and working hours consistent with the best union conditions, sufficient to enable the school to be self-supporting.

Two members of the union who were considered competent to give instruction have been chosen as instructors and have been quite successful in this work. The *Journal* states:

"We started with the idea of doing the work ourselves and to overcome those things in which we were deficient, so that our school is maintained in every particular by our lodge. We can see no reason in the world why we as workers should not be able to establish our own schools, at least in large industrial centers. In our opinion it would be the means of helping those of our members who are in need of help, and especially those who have secured work in certain branches in the trade with which they are not acquainted. Not only would it help such men, but it would be a means of help in improving the very best mechanics who may be working at the business."

#### FOR LADY TEACHERS ONLY.

(In Revenge!)

*Ten Minute Test in English, Spelling and Zoology.*

Explain the following conversation:

*Pupil*—Teacher, I fell off the horse, struck the head of a brad, stripped the thread off the spur, bent the nibs and broke the bit. The shank is stuck in the alligator jaws and I cannot hold the sleeve with the monkey wrench. What shall I do?

*Teacher*—Grab the brace near the ratchet with the tail vise but don't break the pawls, then use an alligator wrench. After you get thru begin work on the drawer.

*Pupil*—What joints shall I put in the drawer? Would you think a miter joint fastened with a feather or two, suitable for a table drawer?

*Teacher*—No. You might rabbit and gain the front corners, and butt the back. But if you wish a fine piece of work you should put a half-blind dovetail on the front corners and house the back corners. In either event you might use a dado and plow the front and sides to receive the bottom.

P. S.—Will the ladies please classify the menagerie?

*Milton Clauser, Salt Lake City.*

#### FOUR-YEAR GARDEN COURSE FOR GIRLS.

To meet the demands of thousands of southern girls who have been successful in raising a tenth-acre of tomatoes and who want to "go on," the representatives of the Department of Agriculture and the State colleges in charge of the canning clubs in the fifteen Southern States have worked out a progressive, four-year garden and canning course. The purpose of this course is to start the girls with one crop and add new annual crops, encourage them to run winter and glass-frame gardens, and finally to lead them to plant perennial small and orchard fruits. It is hoped that the girls will gain knowledge of how to handle a variety of garden vegetables and trees and that the member by the time she gets ready to go to high school or college will have a garden of perennial fruits that readily can be cared for by other members of her family.

The first year of girls' club work thruout the Southern States consists in raising tomatoes in tenth-acre gardens. It is believed by those in charge that every girl should first master this plant and learn how to utilize or sell its products before she takes up other vegetables and fruits. In sections where tomatoes suffer from blight and wilt, however, it is sometimes necessary to substitute another garden crop.



The second-year girls continue to grow tomatoes on one-half of their space and devote the other half to one other crop, preferably beans, peas, peppers, okra, beets, or onions. The girls also are encouraged to start winter gardens in the late summer and fall on one-fourth to one-half of the tenth-acre plots. Lettuce, spinach, and kale are the crops recommended.

The third-year girls grow three crops, continuing the two that have been grown the second year and adding cucumbers, eggplant, fig tomatoes, salsify, parsnips, or horseradish. In each case those in charge of the work select the additional vegetables with reference to local agricultural conditions, market demand, and suitability for canning. Many combinations other than those suggested are possible. For instance, if the community is interested in canning soup mixtures and Creole sauce, they must secure from their gardens tomatoes, peppers, okra, and onions. In fruit-growing sections the girls are advised, when conditions are right, to substitute from 5 to 10 fruit trees for one of the vegetable crops. The member then becomes responsible for the pruning, spraying, and general care of these trees.

The development of crops of perennial vegetables and fruits is insisted on at the end of the third year, and in many cases the work is begun at the end of the second year. The perennials are substituted for some of the annual vegetables and the girls are given credit for the condition of their bushes or trees which are not yet bearing and therefore do not yet yield a product.

It is hoped that several thousand girls, before many years, will have at the end of their junior garden permanent gardens containing some such profitable combinations as the following:

- Strawberries, asparagus, and cherries.
- Raspberries, rhubarb, and plums.
- Gooseberries, currants, and peaches.
- Strawberries, asparagus, and quinces.
- Strawberries, rhubarb, and pears.
- Dewberries, figs, and pecans.
- Currants, asparagus, and grapes.
- Blackberries, figs, and scuppernongs.
- Strawberries, figs, and oranges.
- Asparagus, strawberries, and kumquats.

To enable them to use the products of these permanent gardens, the agents give the girls special instruction in making preserves, jelly, marmalades, pickles, etc.

#### ILLINOIS MANUAL ARTS MEETING.

Friday and Saturday, February 18 and 19, the Illinois Manual Arts Association met in Joliet. This was by far the largest and in some respects it was the best meeting the association has had. This was largely due to the wise and untiring efforts of Mr. A. C. Bauersfeld, Lane Technical High School, Chicago, the president. More than two hundred members were actually enrolled. Considerably more than this number were present at the annual banquet, a delightful affair at which Supt. John D. Shoop of Chicago gave the principal address.

A very large delegation of Chicago manual training and domestic science teachers were present. This was the first time a strong effort had been made to interest the teachers of the household arts in the organization. A very strong Household Arts Round Table program was arranged, with Mrs. N. E. Byrud, Chicago, as chairman.

Among the especially good parts of the unusually good program were addresses by the following people: Dr. C. A. Prosser, Minneapolis; Mr. W. H. Varnum, University of Wisconsin; Miss J. H. Snow, Chicago Teachers College; Miss Hinchliff, DeKalb Normal School; Mr. Wm. Bachrach, Supervisor Commercial Work, Chicago; Mr. C. E. Howell, Decatur; Mr. Sylvester, Springfield; and Miss Edith Brown, Lane Technical High School.

Friday forenoon was devoted by the members to visiting classes and inspecting exhibits in the Joliet Township High School and in the Central Manual Art School for the grades. The exhibits were unusual both in variety and excellence. The regular sessions were held in the commodious new social center building of the Farragut School.

During the various sessions and at the banquet most excellent music was furnished by the Township High School Orchestra, the Farragut School Orchestra, and various teachers in the Joliet schools. The entertainment furnished by Joliet was excellent and much appreciated.

The next meeting of the association will be held in Peoria. The officers for next year are as follows:

President, L. D. Perry, Supervisor of Manual Training, Joliet; Vice-President, Mrs. H. M. Sabin, Dept. of Household Arts, Lucy Flower High School, Chicago; Secretary-Treasurer, Mr. Leuchtenberger, Supervisor Manual Training, Centralia; Editor, L. W. Wahlstrom, Francis Parker School, Chicago.

#### HOMEMAKING PRACTICE HOUSES.

The homemaking practice house is as distinctly a legitimate part of the equipment for teaching home economics as the sewing machine, ironing board or individual cooking equipment, and is a prominent feature in the present and future progress of the subject, according to the United States Bureau of Education.

In the past, schools and colleges have not included the homemaking cottage as a part of the school equipment and they have been slow in recognizing its part in the teaching of home economics. With the growing recognition of the practical value of the subject in the course, and the increasing use of the practice house, more departments have been supplied. It has been effectively shown that the practice house offers opportunities for experimental studies in household administration, makes possible practice in home furnishing and affords excellent opportunity for studies in nutrition at a moderate cost.

At present, 23 States offer lessons in home economics for state-wide use. The state manual of study for Alabama elementary schools contains lessons in cooking and suggestions for teaching sewing, with lists of equipment and references for teachers. In California, each county or city board prescribes its own course of study. In Illinois, an outline for a home economics course is in use in the city graded schools and the rural schools.

Home economics is a recognized course in the agricultural colleges thruout the country, to which women are eligible. Thirty-one state universities and practically all state normal schools offer courses for prospective teachers. A large number of the private and denominational colleges and universities offer similar instruction.

The progress of home economics teaching has been materially aided by the summer schools. During 1914, 192 schools offered summer courses, and in 1915 the number had increased to 230. It is predicted the year 1916 will witness a still larger number of schools offering courses.

#### NEW ASSOCIATION OF TEACHERS OF PRINTING.

To systematize and perfect methods of teaching printing in the schools thruout the country the teachers of this newest manual arts subject have begun the formation of an association which is to be international in character. Inasmuch as printing is now being rapidly introduced, its teachers feel the necessity of an adequate means of interchanging ideas.

The new association will bring printing teachers together for mutual benefit. They will have an opportunity of comparing notes and of exchanging experiences. No meetings have been held but a series of conferences on or-



ganization have been planned by a few leaders and early advocates of printing as a school subject.

Mr. W. Earnest Reeves of St. Louis has assumed the responsibility of calling the first conference and of assisting in organizing the general association as well as sectional associations. It has been suggested that the general association be called the International Association of Teachers of Printing. Sectional conferences have been called for April 17-18 in New York City, for May 1, 2, 3, in Grand Rapids, Mich., and for a later date in California.

Prominent among the men connected with the movement are Mr. R. A. Loomis of Jersey City; S. J. Vaughn, DeKalb; Robert Rankin, Duluth; Frank Siddall, Newark; Edwin Cooper, Bridgeport, Conn.

#### THE WESTERN DRAWING AND MANUAL TRAINING ASSOCIATION, GRAND RAPIDS.

As weeks go by and plans mature, all things look bigger and better for the Grand Rapids meeting of the Western Drawing and Manual Training Association, May 3, 4, 5, 6.

In addition to the speakers already announced—Mr. Lorado Taft, Gov. Ferris, Dr. Haney and Dr. Prosser—the following well known people have been secured: Mr. George Whitworth, Treasurer of the Berkey & Gay Furniture Co., Grand Rapids; Miss Jeanette Buckley, head of the Normal Art Department, Chicago Art Institute; Mr. C. Matlack Price, Associate Editor Good Furniture Magazine; Mr. W. H. Varnum, head of Art Department, University of Wisconsin; Mr. Gustav B. Eggert, Prin. Arthur Hill Trade School, Saginaw, Mich.; Mr. Wm. J. Bogan, Prin. Lane Technical High School, Chicago.

No effort is being spared to provide the best possible accommodations for the meetings, the exhibits, and the members. The entertainment features have already been planned, and definite preparations are in progress even at this early date.

Another Bulletin will be in the mails after March 15. The complete programs will be distributed before April 1.

The record of attendance will undoubtedly be broken. The slogan is TWELVE HUNDRED FOR GRAND RAPIDS.

#### THE EASTERN ARTS CONVENTION.

The plans for the convention of the Eastern Arts Convention, to be held at Springfield, Mass., April 20, 21 and 22, are rapidly being completed by the program committee. According to Mr. Morris Greenberg, chairman of the press committee, no wide-awake teacher or supervisor of art, household, industrial or vocational training can afford to miss the inspiring and stimulating addresses which will be given.

President Millard B. King and E. E. McNary have been busy with 25 committees since January, to make the convention worth while both from the professional and social viewpoints. There will be a dinner, organ recitals, a number of educational and commercial exhibits, and personally conducted tours to industrial plants, in addition to the general and round-table sessions.

Teachers who wish to attend the meeting and who are not members of the association, are invited to write to Mr. Fred P. Reagle, Montclair, N. J., for a program and other information.

#### NEW YORK HIGH SCHOOL STUDENTS AWARDED MEDALS FOR BEST ART WORK.

Twenty-two students in as many New York high schools have been awarded Alexander medals for the best record in classwork and examinations for the first two years of the high school course. The students were selected by the art department of the schools on the basis of their class records

in art work. The medals have been named in honor of the late John W. Alexander, president of the School Art League from its foundation in 1911 until his death, and they are presented by the League for the encouragement of artistically inclined students. The following are the names of the students and the schools they represent:

Alexander F. Bernstein, De Witt Clinton High School; William Cohen, High School of Commerce; Margaret Dalton, Julia Richman High School; David H. Rogers, Stuyvesant High School; Marion Rees, Wadleigh High School; Hilda Altschule, Washington Irving High School; Edwin Bauer, Evander Childs High School; Marion Jamison, Morris High School; Dorothy Reid, Bay Ridge High School; Lloyd Norris, Boys' High School; John Whitney, Bushwick High School; Max Goldberg, Commercial High School; Violet Gorman, Eastern District High School; Mildred I. Fleming, Erasmus Hall High School; Florence Cole, Girls' High School; Minnie Weisberg, Bryant High School; Ada Edsall, Far Rockaway High School; Donald Weaver, Flushing High School; John Clerke, Jamaica High School; Karl Weber, Newton High School; Andrew I. Hollister, Richmond Hill High School; and Ruth B. Griswold, Curtis High School.

#### NEWS FROM THE FIELD.

The Women's Educational and Industrial Union of Boston is offering a one year's course in Vocational Guidance, designed to fit women of adequate preliminary training to become vocational advisors in public schools, or social agencies, by providing them with a knowledge of industrial conditions and methods of industry, investigation and use of statistics.

For the year 1916-1917 the class will be limited to six women who have had experience in teaching or social work, and who seem especially fitted to profit by the training offered. Miss Florence Jackson, director, will be glad to correspond with persons desiring to take up the work.

The Putnam State Trade School, Putnam, Conn., has inaugurated evening courses in electrical work, carpentry and cabinetmaking, patternmaking, textile designing and cloth analysis, ring spinning, twisting and warp preparation, machine-shop practice, drafting and shop mathematics.

*Fort Wayne, Ind.* Twenty apprentice printers have been enrolled in the evening vocational school. Attendance in classes has been made compulsory by the local Typographical Union.

*Chicago, Ill.*—A class for bakers' apprentices has been formed at the Lane Technical High School. One hundred and twenty boys have enrolled. Mr. Frank Hafner of the Bakers' Union and Mr. Ernest J. Vieser, an icing expert, are the instructors.

Cobbling as a part of the manual training course has been incorporated in eighteen schools at Chicago, Ill. It has been noticed that the children of the poorer families take an interest in mending their shoes instead of throwing them away. Shoes so mended last from a month to six weeks longer than they ordinarily do.

*Chambersburg, Pa.*—An unused school building has been remodeled and equipped for vocational classes.

*Lincoln, Neb.*—With the opening of the second school term, a complete pre-vocational plan has been put into execution. Shopwork for boys and domestic arts for girls are required subjects in the ninth grades of the three pre-vocational schools. In the eighth grades, commercial and industrial geography, and printing are offered in addition to regular subjects. Eighty minutes each week are devoted to physical training in the seventh, eighth and ninth grades of the pre-vocational schools, and music occupies eighty minutes in the seventh and eighth grades.

*Brooklyn, N. Y.*—A special course in woodworking for teachers who teach in special or ungraded classes was offered in February by the Brooklyn Teachers' Association. The course sought to prepare these teachers for their work and to offer instruction to those interested in the arts and crafts. The course covered use and manipulation of tools, adaptation of tools to forms of construction, class management and shop organization.

*Lafayette, Ind.*—Day classes in woodworking have been formed for boys between 14 and 20 years who have withdrawn from school and who need assistance in learning a trade. A special course in salesmanship has been inaugurated, with afternoon and evening classes.



### HUDSON COUNTY INDUSTRIAL TEACHERS' ASSOCIATION.

On February 5th a hundred teachers of industrial subjects gathered at the Dickinson High School of Jersey City in an all-day session held with view to effecting a county organization for Hudson County which includes Jersey City, Hoboken, Bayonne and several other municipalities.

The meetings and conferences were varied in character and aroused an interest which brought much enthusiasm to the idea of a permanent organization.

Mr. E. G. Trana, Director of Industrial Education in Hoboken, acted as chairman of the day and at the opening session of the forenoon introduced Mr. E. A. Reuther, the State Supervisor of Manual Training, who delivered an earnest address upon the importance of close acquaintance and co-operation among the teachers of the county and the opportunities for mutual helpfulness which a county organization would afford.

The assembly then separated into groups, including respectively, teachers of machinshop practice, woodworking, domestic science, sewing, millinery, drawing and industrial-academic work. Each group effected a provisional organization of its own and elected a member of the committee on organization.

The remainder of the forenoon was given to an inspection of the industrial work and equipment of the high school.

The afternoon session was opened by Mr. F. E. Mathewson, Director of the Technical and Industrial Department of the High School, who discussed the work of this department.

The final address was delivered by Mr. L. H. Carris, Assistant State Commissioner of Education, in charge of Industrial Education, who told of the Convention of the National Society for the Promotion of Industrial Education, recently held at Minneapolis.

The report of the committee on organization was presented by the chairman, Mr. M. W. Haynes, Principal of the Bayonne Vocational School. The entire management of the association was placed in the hands of an Executive Council to consist of three members-at-large and one representative from each of the special groups previously organized. The following members of the council were elected:

Members-at-large—Messrs. Trana, Mathewson and Stimets.  
Machinshop Practice—E. R. Corr.  
Woodworking—E. L. Wagoner.  
Sewing and Millinery—Miss Frances Cassidy.  
Drawing—W. O. Hamblin.  
Domestic Science—Miss C. E. Pratt.  
Industrial-Academic Work—Mrs. C. K. Carswell.  
Adjournment was taken after the acceptance of an invitation from Mr. Trana to hold the March meeting in Hoboken.

### OHIO ASSOCIATION MEETS.

The Ohio State Industrial Arts Association opened its annual meeting at Columbus, with a membership dinner on February 11th. Judge Baggott of the Juvenile Court, who was the first speaker, gave a helpful talk on "The Best Way of Getting at the Boy."

The program for the second day included addresses on "Lead or Drive" by Supt. J. A. Shawan, Columbus; "The Printing School" by J. H. Chambers, Dayton; "The Present Outlook in the Field of Manual Arts," by C. A. Bennett, Peoria.

Prof. Dell, Supervisor of Industrial Arts at Columbus, directed the preparation and installation of an exhibit of industrial arts work. An entire floor of the library building was given over to the display which attracted a great deal of attention. The meeting concluded with the election of the following officers: President, Samuel Moyer, Sandusky; Secretary-treasurer, A. S. Valentine, Kent.

### GREATER NEW YORK ASSOCIATED TEACHERS OF SHOPWORK.

One of the largest meetings of the Associated Teachers of Shopwork of Greater New York was that held on February 4, at Terrace Garden, New York. About one hundred were in attendance.

Mr. Peter J. Brady opened the meeting with a talk on "The Attitude of Organized Labor," particularly its relation to Industrial Education. Mr. Brady pointed out that a survey of the industries of a city should be made preparatory to the development of a system of industrial education. He showed that organized labor is in sympathy with industrial training in the schools, but that it is withholding its approval pending the adoption of definite types of training for trade conditions. Organization of teachers of industrial education was strongly urged by Mr. Brady. Such an organization is needed to protect the interests of the teachers as well as the welfare of the children who attend the manual-training classes.

Mr. Lawrence Young, of Brooklyn, the second speaker, who two years ago made a special study of the German schools, gave a talk on "The Possibilities of Developing Applied Design Thru Work in Metal and Wood." Mr. Young showed that a beginning in the study of design and its application, can be made in wood carving and art metal work. He gave in detail, the methods to be followed in teaching the subject to eighth-grade pupils.

Mr. Tristram Metcalf of the New York Globe, urged that teachers take a greater interest in school affairs. New plans and methods of teaching should be carefully studied for evidences of real worth before they are tried out in the schools. Mr. Metcalf told of his visit to the Gary schools and commented on the fact that fifty per cent of the school population is housed in two schools.

Mr. Wm. Carter of Queens Borough, New York, described the molding work performed in the shops of the schools.

Wm. A. Carter.

### SOUTHWEST OKLAHOMA MANUAL ARTS MEETING.

The Manual Arts Section of the Southwest Oklahoma Teachers' Association met on February 18th at Altus, in connection with the regular teachers' sessions. Mr. Frank H. McCrea, Weatherford, acted as chairman at the sessions.

"How to Place Vocational Training on a Par With All the Phases of Education" was discussed by G. E. Davenport, Elk City; "Manual Training Subjects of Practical Value in High Schools," by Fred C. McCrea, Hobart; "Methods of Procedure in Assembling Furniture and Glue Work," by B. J. McGee, Lawton; "Advisability of the Manual Arts in Rural Schools," by F. H. McCrea, Weatherford; "Individual Work vs. General Work," by O. J. Palmer, Mangum.

### ANNUAL EXHIBIT OF EVENING WORK AT PRATT INSTITUTE.

The School of Science and Technology of Pratt Institute, Brooklyn, New York, held a "visitors' night" on the evening of March 8th. The shops, laboratories and drawing rooms were open from eight to nine o'clock, giving opportunity to all to observe the work of the students and to inspect the methods and results.

The school offers instruction in industrial electricity, technical chemistry, mechanical drawing and machine design, strength of materials, stationary engineering and power plant machinery, machine work and toolmaking, forge work, carpentry and building, patternmaking, sheetmetal work, plumbing and trade teaching for the training of skilled workmen who desire to prepare themselves for the teaching of their trades.

The School is now giving instruction in its evening courses to more than one thousand men regularly employed in various vocations, who use these courses as a means to prepare themselves for more effective service.

### THE SOCIETY'S DRAWING TROPHY CONTEST.

On Saturday, January 15th, the high schools of New York City held the second contest for the New York Municipal Art Society trophy. Fourteen teams of five pupils each entered the contest, the pupils in each team being students in the fourth term of the school course. Mr. Charles W. Stoughton, of the Society; Mr. Royal Bailey Farnum, State Agent for Drawing; and Dr. James P. Haney, Director of Art in the High Schools, acted as judges.

The DeWitt Clinton High School won the trophy by a total of 255.5 points. The Stuyvesant High School secured second place with 218.5 points and the Bay Ridge High School third place with 202.5.

On the same day, teams from nine high schools made drawings for a similar trophy offered to pupils in the third high school year by the School Art League. In this contest, the DeWitt Clinton High School again won first place, with the Bushwick High School second and the Julia Richman High School third. The trophy offered by the School Art League consists of a bronze medallion designed by Mr. John Flanagan. Miniature copies of the two trophies were distributed to the winners at the Commencement Exercises of the DeWitt Clinton High School, held on Thursday, January 27th. This school will hold the two trophies for six months, the next competition being scheduled for June, 1916.

Emporia, Kans.—A course in furniture making has been introduced in the manual training department of the Emporia Normal School. The course covers the theory and application of design to articles constructed, history of furniture and present day styles, construction of practical articles, upholstering and caning. Mr. G. K. Wells is instructor.



# NEW BOOKS AND PAMPHLETS

## Industrial Art Textbooks.

Bonnie E. Snow and Hugo B. Froehlich; illustrated by George W. Koch. The Prang Company, New York, Chicago; Boston, Atlanta, Dallas.

"Part Three" and "Part Four" of this series are now published in addition to "Part One" and "Part Two" which appeared last year. We were enthusiastic over the first two books, and feel more so with the addition of "Part Three" and "Part Four."

The statement of introduction to these texts expresses a theory that "Representation is not a basic or fundamental art principle." "Ability to draw is important as a means to an end; it should not be considered as an end in itself." This theory is becoming a conviction with art teachers, and these splendid texts prepared by these teachers of experience, are needed in every school in the land to help revise the art instruction of the grades.

Each of the four texts begins with arrangements of colors and shapes. Representation is used in the series as ability to draw is needed, but the cultivation of taste thru practice in the selection and adjustment of forms, tones and colors for the practical purposes of life is the purpose in the minds of the authors.

There can be no "last word" in this kind of instruction. We need much more of such definite methods and material. These texts are compiled from years of experience with children in the schools, and there is not an impractical exercise in them. No child can escape the influence of such instruction. The misdirected "drawing lesson" which has interested the few gifted ones, and has failed to influence the majority, is relegated to the school scrap heap. In these texts the children are given definite well directed practice in selection and execution which they will use every day in and out of school and thruout their lives.

## Practical Inlay Work.

By Oscar James Palmer. Price, 50 cents. Peerless Publishing Company, Mangum, Okla.

This practical little pamphlet discusses in detail the elements of inlaying as applied to cabinetwork. It will be found helpful for any teacher who may desire to offer this branch of cabinetmaking in his shop.

## Toy-Making for Infants.

Bertha Eden. 119 pages. Price, \$1.00. Isaac Pitman & Sons, New York.

This is an illustrated description of various toys which may be made of paper, cardboard, and wood. The chief divisions of the projects are those under the headings, "Trades and Occupations" and "Means of Transit."

## The Art of Basket-Making.

Thomas Okey. 154 pages. Price, \$1.00. Isaac Pitman & Sons, New York.

This is a well written, excellently illustrated book, on the making of Willow Baskets. It is written by a journeyman basketmaker who has followed the trade for twenty years. The work of making various kinds of willow baskets is described clearly and in detail. The book will be of great service to anyone interested in this line of work.

## Making Curtains and Hangings.

By Agnes Foster. 64 pages. Price, 50 cents, net. Postage, 4 cents. McBride, Nast & Co., New York, N. Y.

This little book is designed to furnish the homemaker, or curtain salesman with all of the available information regarding curtains and hangings and to serve as a guide in the selection of curtains and hangings. It discusses the general principles of exposures, locality, architecture and their relation to hangings, gives points to be observed in selecting quality and color in curtains, and gives directions for making curtains for various styles of windows.

## Report of the Minneapolis Survey for Vocational Education.

Bulletin Number 21. National Society for the Promotion of Industrial Education.

This report of 700 pages gives the results of the survey which has just been completed of the schools and industries of Minneapolis. After discussing at some length the need for vocational education in Minneapolis, the report seeks to evaluate the work of the public schools, evening schools, private vocational schools and other institutions of Minneapolis. It shows the need for vocational education in the building trades, electrical work, metal and wood trades, turning trades, flour mills and

bakeries. It discusses the vocational education needed by girls who work in laundries, garment trades, dressmaking and millinery, knitting mills and salesmanship. One chapter is devoted to training in home gardening and elementary agriculture. Considerable space is also devoted to training for office work and homeworkers.

It is probable that this report will for sometime be considered an authority on the subjects which it treats.

Copies are furnished free to members of the society and others may secure copies for 75 cents for single copies; 50 cents in lots of ten. C. A. Prosser, Dunwoody Institute, Minneapolis.

## Glue Handling—Part 1.

By Friman Kahrs. 144 pages. Price, \$1.00. Published by Author.

This book is intended as a handbook for those who buy, sell and use glue. The author is an expert in the making and judging of glue, having served in the glue trade for eighteen years. It is intended primarily for a trade handbook, but persons desiring authentic information regarding glue, may find it in this book.

*Co-operation between Employers and Schools.* Rochester school print shop, Rochester, N. Y. This beautifully printed pamphlet describes the co-operative plan arranged by Mr. Raymond C. Keople between the Rochester schools and the large employers of labor in the city.

*Vocational Education Survey of Richmond, Va.* Bulletin 162. United States Bureau of Labor Statistics. Paper, 333 pages.

This is the long-awaited report of the Vocational Education Survey of the City of Richmond, conducted in the spring and summer of the year 1914, and completed in the fall of the same year. The report will be of great service in the study of local occupations and in adapting local educational courses to the needs of present and prospective workers.

Richmond is, perhaps, unique among the cities of the country in that it has an exceedingly stable population and stable industries. Its greatest need is not trade training as such, but elementary education in the three R's. The report does not advocate the establishment of a trade school, but suggests the development of prevocational courses for boys and girls, and short night courses for men and women.

*Every Farm a Factory.* By Charles M. Carroll, International Harvester Co., Chicago. A valuable pamphlet for rural teachers who are interested in more than classroom work. It discusses plans for improving the production and distribution of farm crops.

*Report of a survey of the public schools of Leavenworth, Kansas.* This is a report of a survey conducted under the auspices of the Kansas State Normal School. The report contains considerable material which will be of interest to all teachers of industrial arts. It contains statistical information regarding the occupations of the city, and the training which might be given for them in the schools, and shows to what extent the needs are being met by existing institutions. Copies may be secured from the Kansas State Normal School, Emporia, Kansas.

*Vegetable Gardening.* Agriculture Leaflet No. 4, New Jersey State Department of Public Instruction, Trenton, N. J. This leaflet, which has been prepared by Mr. Lewis H. Carris, Assistant Commissioner of Education in charge of Industrial Education, contains suggestions for making vegetable gardening an integral part of the course in country schools. It is not a textbook or a course of study but contains enough material so that any teacher may prepare her own outline and do constructive work.

The Dixie School Messenger is the title of a modest eight-page monthly which the students of the Chattanooga High School have begun to publish. The editorial material is supplied by the teachers and students of the school under the direction of Principal Charles H. Winder, and the mechanical work is done in the Manual Training Department. The publication is wholly a school project.

The Ceramic Society of Greater New York has announced its annual exhibition to take place from April 5 to April 19 inclusive. The display will be made in rooms which have been set aside especially for the Society in the American Museum of Natural History, 77th Street and Central Park West. The preparations are under the direction of Miss Charlotte P. Palmedo, chairman of the exhibit committee. Table decorations will be especially emphasized.



# NOW, ARE THERE ANY QUESTIONS?

This department is intended for the convenience of subscribers who may have problems and questions which trouble them. The editors will reply to questions, which they feel they can answer, and to other questions they will obtain replies from persons who are competent to answer. Letters must invariably be signed with full name of inquirer. If an answer is desired by mail, a stamped envelope should be enclosed. Address, Editors, Industrial-Arts Magazine, Milwaukee, Wis.

## POTTERY WORK.

333. Q.—Will you kindly answer the following questions in the next issue of the Magazine? They are in reference to the article by Mr. Varnum on "The Surface Enrichment of Clay." (1) What kind of pigments are to be used for inlaying? (2) What kind of a colorless transparent glaze should be used? (3) What number of cones should be used for this kind of firing? (4) How many firings are necessary for one piece of pottery for underglaze painting?—M. I. S.

A.—(1) *Pigments used for inlaying.* Common pigments to be obtained from a paint store; Umber, Yellow Ochre, Burnt Sienna; pigments obtained from Drakenfeld and Company, Park Place, N. Y., or other ceramic materials dealer; underglaze colors. These pigments are to be mixed with powdered clay in proportions varying from five to ten per cent.

(2)—*Colorless transparent glaze for inlaying.* White lead, 3.1; whiting, 20; feldspar, 112; zinc oxide, 32; calcined kaolin, 22; flint, 200.

(3)—*The above glaze should be fired to Cone .02.*

(4)—*Two firings are necessary for underglaze painting, (a) the biscuit firing, and (b) the glaze.* The underglaze is placed upon the biscuit and the overglaze is placed on the underglaze. The project is then fired for the second and last time.—Wm. H. Varnum.

## Books on Manual Training Design.

338. Q.—Please recommend a text in manual training design.—E. R. B.

A.—*Crocker's Furniture Design and Drafting.* J. T. Comstock & Co., New York.

*Crawshaw's Furniture Design for Schools and Shops.* Manual Arts Press, Peoria.

*Varnum's Industrial Arts Design.* Scott, Foresman & Co., Chicago. (In press.)

*Nye's Furniture Design and Drafting.* Manual Arts Press, Peoria.

## Books on Shop Mathematics.

339. Q.—What have you for a practical shop arithmetic that is suitable for high school students and for night classes?—J. P. P.

A.—*Shop Problems in Mathematics.* By Wm. E. Breckenridge, S. F. Mersereau and C. F. Moore. \$1. Ginn & Co., Boston.

*Vocational Mathematics.* By Dooley. \$1. D. C. Heath & Co., Chicago.

*Practical Shop Mechanics and Mathematics.* By James F. Johnson. \$1. John Wiley & Sons, New York.

*Arithmetic for Carpenters and Builders.* By R. B. Dale. \$1.25. John Wiley & Sons, New York.

*Mathematics for Machinists.* By R. W. Burnham. \$1.25. John Wiley & Sons, New York.

## Designs for Wood-Turning Projects.

353. Q.—Where can I obtain designs for wood-turning projects?—R. F. G.

A.—*Crawshaw's Problems in Wood Turning.* Manual Arts Press, Peoria.

*Ross's Elementary Wood Turning.* Ginn & Co., Boston.

*Selden's Elementary Turning.* Rand, McNally & Co., Chicago.

*Golden's Laboratory Course in Wood Turning.* American Book Co., Chicago.

Additional projects may be had from any of the blueprint concerns mentioned in the *Industrial-Arts Directory*.

## Finishing Copper Bowls.

359. Q.—Will you kindly inform me, thru your Query Column, how the green finish is obtained on copper bowls?—R. G. W.

A.—The commonest method is to expose the bowl to the fumes of spirits of ammonia until the desired color has been obtained. The copper must be absolutely clean and free from finger marks.

## Books on Textiles.

363. Q.—If you know of any books on Textiles, (cotton manufacturing, woolen manufacturing, worsted weaving, cotton and woolen weaving) will you please let me hear from you at your earliest convenience?—J. D. M.

A.—*Textile Fibers of Commerce.* By W. J. Hannan. \$3. Lippincott & Co., Philadelphia.

*Textiles and Clothing.* By Kate H. Watson. \$1.50. American School of Home Economics, 506 W. 69th St., Chicago

*Story of the Cotton Plant.* By Frederick Wilkinson. \$0.40. D. Appleton & Co., New York.

*Textile Raw Materials and Their Conversion into Yarns.* By Julius Zipper. 11s. 6d. Scott, Greenwood & Co., London.

*Hand Loom Weaving, Plain and Ornamental.* By Luther Hooper. \$2.25. Macmillan Co., New York.

*Textbook of Clothing and Textiles for High Schools.* By Laura I. Balldt. Lippincott Co., Philadelphia.

*Textiles.* By A. F. Barker. \$2. D. Van Nostrand Co., New York.

*Textiles.* By Wm. H. Dooley. \$1.25. D. C. Heath & Co., Boston.

*Household Textiles.* By Charlotte Gibbs. \$1.25. Whitcomb & Barrows, Boston.

*Textile Fibers.* By J. M. Matthews. \$4. John Wiley & Sons, New York.

*The Story of Textiles.* By Perry Walton. Lawrence & Co., Boston.

*Warp and Woof.* Book I, Linen. \$0.30. Educational Publishing Co., New York.

*Jute and Linen Weaving.* By Thomas Woodhouse and Thomas Milne. \$3. Macmillan Co., New York.

## Cement Designs.

364. Q.—I want a book of designs for cement forms for art cement work.—T. G. L.

A.—*Concrete Pottery and Garden Furniture.* R. C. Davidson. \$1.50. Munn & Co., New York.

*Ornamental Cement Work.* By O. Wheatley. \$2. D. Van Nostrand Co., New York.

*A Treatise on Ceramic Industries.* By Emile Bourry. \$5. D. Van Nostrand Co., New York.

*Manufacture of Concrete Stone.* By Harvey Whipple. \$1. Concrete Cement Age, Detroit, Mich.

The following firms manufacture ornamental molds for cement work:

Lansing Co., 601 Cedar St., Lansing, Mich.

Hayden Automatic Machine Co., Columbus, Ohio.

Pettyjohn Co., Terra Haute, Ind.

Indiana Concrete Form Co., Indianapolis, Ind.

Ideal Concrete Machinery Co., Cincinnati, Ohio.

Simpson Cement Mold Co., Columbus, Ohio.

Architectural Mold Co., Detroit, Mich.

W. E. Dunn Mfg. Co., 4138 Fillmore St., Chicago, Ill.

## Fuming Woods.

368. Q.—Can you tell me (a) what woods may be fumed with ammonia; (b) what strength ammonia must be used and (c) what acid is sometimes used to facilitate the action of the ammonia and how is it applied?—C. H. B.

A.—(a) White oak and chestnut are the two best woods to fume. Red cedar, Idaho cedar, western larch, will also fume, or change to a brown shade. Red oak will not fume.

(b) Aqua ammonia of 28 per cent strength.

(c) Tannic acid; 1 oz. to  $\frac{1}{2}$  gal. of water. This is applied to the surface of the wood with a brush or a piece of cheesecloth before placing fuming box. It will be necessary to sand after fuming if this solution is applied. Tannic acid and pyrogalllic acid, 1 oz. of each to a gal. of water, is just a little better than the tannic acid alone.—J. M. D.

## Ukulele.

377. Q.—Please inform me as to the correct pronunciation of the name of the Hawaiian musical instrument—the Ukulele—which was described in your magazine.—L. A. B.

A.—The word is pronounced you-ka-lay-lee, with the accent on the third syllable. There is a song, "When old Bill Bailey plays the ukulele, etc." Make it rhyme and you will have the correct pronunciation.—W. H. H.

## Minneapolis Report.

378. Q.—Will you kindly tell me how and where I may secure a copy of the report of the Minneapolis Vocational Education Survey, recently issued?—J. A. C.

A.—We are informed that a limited number of the reports can be secured at seventy-five cents a copy from C. A. Prosser, Dunwoody Institute, Minneapolis.—W. H. H.